

TANDY LAPTOP COMPUTING

JUNE 1992 -VOL. 9, NO. 6

TERRY KEPNER'S

portable 100

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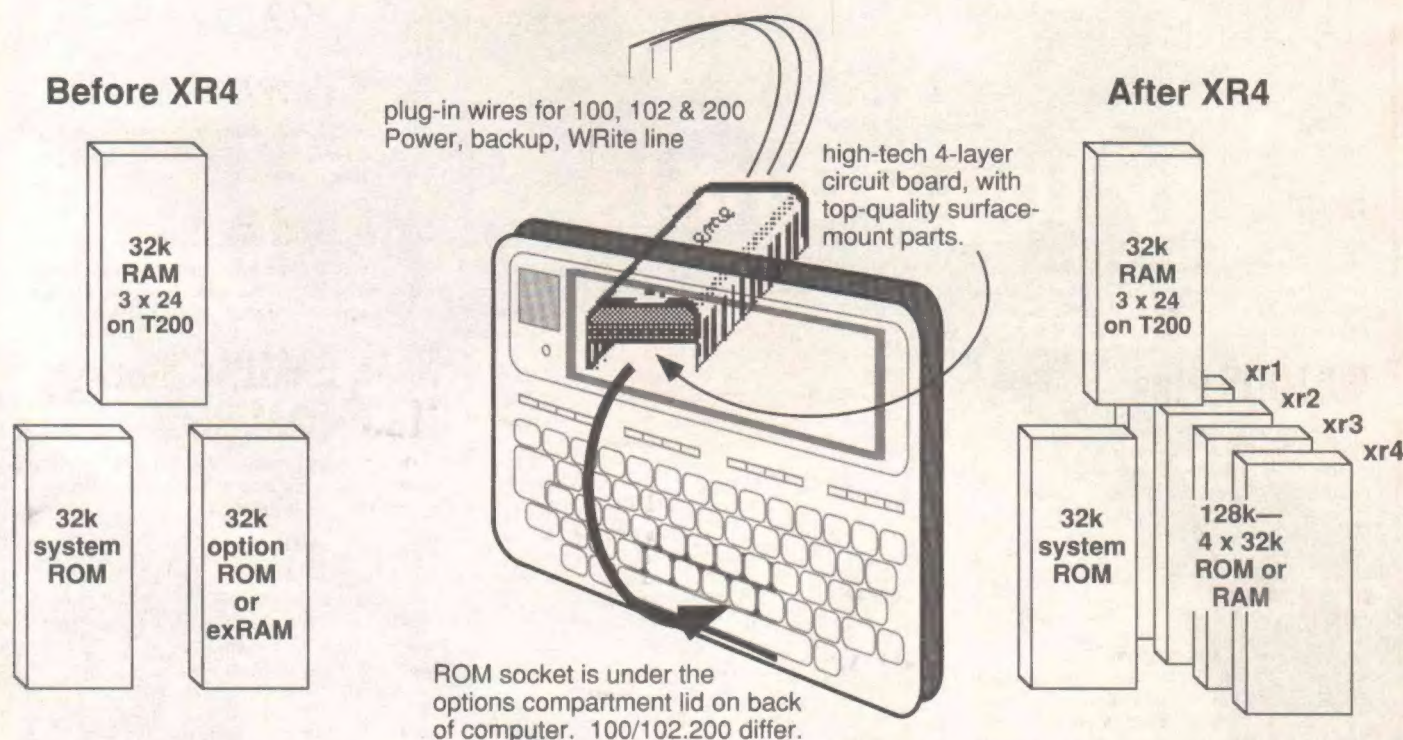
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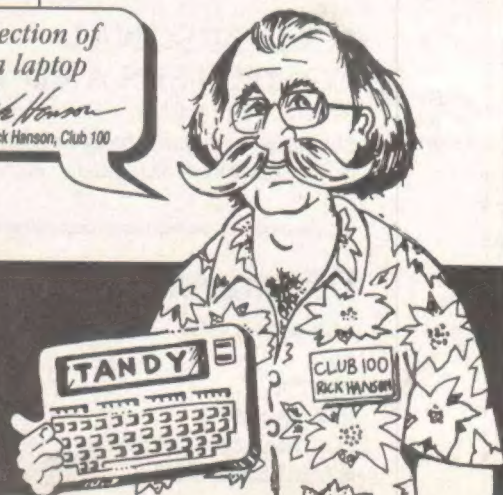
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Circle 165 on reader service card.



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ROM WITH A VIEW

Summer is here at last. While the nights are unusually cool for this time of the year, the days are still nice and hot. The muggy weather hasn't started yet, but the pollen season has. Fortunately, we have air conditioning that keeps the office from becoming unbearably hot (all these computers and printers generate lots of heat).

But even the air conditioner couldn't keep the temperature cool when we heard that the printer had made a mistake with last month's issue. Instead of shipping the magazine out on schedule, it sat on the loading dock for several weeks. Only when we called to ask about not receiving any office copies did we discover the error. This was on the 20th of May!

They made profuse apologies and promised to set things straight. Instead they got worse. Our newsstand distributor called, irate at the non-delivery of his issues. We explained the problem and told him the missing ones should arrive the next Tuesday. On the Thursday following, he called again. Now he had over a thousand newsstand operators screaming at him about receiving a bill for a magazine not delivered (his computer sent bills on Wednesday).

The magazines had not arrived. A call to the printer revealed that the trucking company had sent the magazines to the wrong state, and promised to get them to the distributor that day. Friday, May 29th, the distributor called. *Portable 100* had finally arrived, minutes before their loading dock (all union) closed for the day. After a several minutes debate with management, the union guys decided to stay an extra couple of minutes and unloaded the truck (Thanks guys! You cannot know how much we appreciate that.)

Final result: May issue delivered to newsstands on Monday, June 1st.

As a consequence of all this, the June issue is a bit late, and the July issue will be a bit late. On the up side, the September issue will be right on time and we will be caught up completely.

Also on the up side is that we received preliminary numbers from the distributor on the first newsstand issue — sell through (number of copies sold versus number put on newsstand) is much higher than expected! Exact numbers aren't available, but we might be hitting better than 20%.

On the heels of this came news that a major distributor is interested in carrying *Portable 100*. If (and that's a big if) he decides to do so, circulation will jump to over 40,000. That makes us a big-league magazine. The result for you, the readers, is that we will attract more advertisers by delivering to them more readers. That, in turn, means a better magazine with more articles about your Tandy portables (both MS-DOS and Model T).

In the meantime, we have the start of what we hope will be a continuing arrangement to have BASIC programs that run on both the Tandy Model T line and the MS-DOS portable line. There was only room to run one of the listings, so we chose the smaller one for the Model 100 line. The MS-DOS program is available on the *Portable 100* BBS for instant downloading. Let us know if this is the route you want us to follow in the future. Also, if you have a program that can run on both, and don't mind sharing it with others, send it to us on disk (or upload it to our BBS) and send us the document file that tells how to make it work (as well as what it does).

Oops. Out of room already. Ta Ta.

Terry Kepner

Toolbox

Manuscripts were typed into Microsoft Word 4.0 on a Tandy 1500 HD, where they were edited, spell-checked, and had basic format instructions inserted. From there they were loaded into a Tandy 4000 (80386 CPU, Tandy EGA Monitor, Tandy LP-1000 LaserPrinter) desktop computer and placed into Aldus' IBM PageMaker 3.01. Once there, design decisions on photo, figure, and listing sizes and placements were made. Here, pull quotes are placed, headlines, intros, and bylines are sized and positioned, and advertisements positioned.

Normally, the Tandy LP-1000 is capable of emulating only a Hewlett Packard Laser Printer Plus, but with the

addition of the Destiny Technology Corporation (300 Montague Expressway, Suite 150, Milpitas, CA 95035. (408) 262-9400) PageStyler 4.5MB kit, the LP-1000 is turned into a fully-compatible PostScript printer, with all 35 native fonts that are found in the Apple LaserWriter Plus printer. The Destiny PageStyler is available through the Tandy Express Order Hardware system.

Page previews were output from the Laserprinter. When everyone was satisfied with the appearance, final pages were output and artwork and line art ads were positioned. The finished magazine was then delivered to the printer, who printed it, labeled it, and mailed it to you.

portable 100

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The four best programs for the Model 100 all on one ROM. 32K of power without using any RAM for program storage. This is the PCSG Snap-In ROM that just presses easily into the little ROM socket in the compartment on the back. You access the four right from the main menu like built-ins.

Write ROM — the definitive word processor for the Model 100. Function key formatting or dot commands. Search and replace. Library feature — inserts words, phrases or whole documents into text from just a code. MAP lets you see a picture of your document. In all there are 60 features and functions. No one can claim faster operation. FORM lets you create interactive forms with on-screen prompts that you can answer from the keyboard. Nothing else for the Model 100 compares with the features of Write ROM. Exactly the same as the Write ROM sold as a single program. Infoworld says it "makes the Model 100 a viable writing unit ... sur-

passed our highest expectations for quality and clarity."

Lucid Spreadsheet: This is the one PICO magazine says "blows Multiplan right out of the socket" and Infoworld performance rated as "excellent" and said "makes the Model 100 compute." Gives you features you cannot get with Lotus 123. Lets you build spreadsheets in your Model 100 that would consume 140-150K on a desktop. Program generating capability with no programming knowledge required. Variable column widths. Includes find and sort with function key control. It's fast, recalculates like lightning. No feature has been taken from the original, only new ones added.

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you like. Complete math between fields. Total interface with Lucid worksheets.

Outliner: Does everything that Think-tank does on a PC but a whole lot better. Includes a Sort for your headlines. Lets you have headlines of up to 240 characters. Has cloning, hoisting and sideways scroll up to 250 characters. Like Lucid, this one sets a new standard for outliners. This is the way to plan and organize your projects.

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Suggestions From Our Mailbox

I've subscribed to *Portable 100* and bought several years of back issues. Great stuff!

I also purchased a *Super ROM*, and now find it indispensable. It is version 1.8 (is this still the latest?) As you predicted, the *Thought* outline is not very useful. Can I still purchase a *Super ROM* with the outline replaced with *Disk+*? If so, I want to be able to transfer files to either a CP/M or DOS computer. I use PC's at work, but prefer using CP/M at home.

I'm sure you get lots of compliments on how great a job you're doing, so I hope you don't mind a little constructive criticism.

- 1) The articles on using the *Super ROM* are a great idea, but very shallow. They don't tell me anything that's not either obvious, or already in the manual. How about concentrating on stuff that's NOT obvious or in the manual?
- 2) Model T advertisers have a bad habit of implying that *Write*, *T-Word*, etc. are word processors. They are NOT "word processors" by any generally accepted meaning of the term. They are just print formatters. You must still use *TEXT* as-is for entering and editing text. The print formatter just reads your *.DO* file, and formats it for printing. I consider it deceptive advertising to imply that *TEXT* and a print formatter make the Model 100 a word processor. It may do the same job in a limited way, but it ain't the same thing.
- 3) Every time someone asks a hardware question, the answer is always "No, it won't work," "You can't do that, it'll cost a fortune," "It's impossible," etc. Not true! We live in a wonderland of electronic marvels, where high-tech state-of-the-art chips are as close as the nearest Radio Shack store. Memory expansion, faster clock speeds, better screens, etc. are not nearly the problem you make them out to be. It's simply a matter of applying oneself to the problem. Talk to a technician or engineer. Investigate the possibilities. Encourage experimentation. If it were any easier to work on the Model T, it would be a Heathkit!
- 4) Publish more quickies. Programming tricks. Hidden commands in certain programs. Work-arounds. Sources of

repair parts. Excerpt comments from the bulletin boards. Sometimes the most valuable thing I get from a whole issue is a single *POKE* command.

Lee Hart, Holland, MI
Parallel Ports

PARALLEL DOES WORK

I was upset with Bob Robertson's article in the December 1991 issue of *Portable 100* magazine on the use of parallel port hard drives with the 1400 LT. The upset came from my just having ordered a parallel port hard drive. This type of drive seemed to be the ideal solution to upgrading my 1400 LT. The other upgrades cost more, were heavier, and sucked up the battery power. Using the 1400 LT as I do when I travel by plane, I have found the 4.5 hour battery time superior to almost anything presently on the market.

Robertson was very convincing in pointing out how the parallel port drives would not work because of a reconfiguring of pin 18. I had no idea what that meant, except that it meant trouble for me. I received the hard drive the next day, a 20MB drive from International Computer Products that I had ordered from DAMARK for under \$300. I plugged it in, followed the simple directions, and, because I am a total computer idiot, promptly called ICP for technical support. They talked me through the setup in five minutes. It works wonderfully well. I have even gotten a compacting program from ICP so that I now have 40MB of storage. The unit has an internal rechargeable battery with a 4 hour charge.

An additional point is that the QuickBrick as advertised in the same issue of *Portable 100* costs \$395. for a 20MB hard drive.

Readers should not be dissuaded from the IPC unit.

Arthur Freeman
Camden, NJ

And for a limited time only, SPC is selling the QuickBrick 20MB and 40MB units at a special price. Check out their advertisement in this issue.

-tk

WHY WRITE FOR FREE?

I'm the managing editor of *Packer Report*, an independent publication that

does nothing but cover the Green Bay Packers. I started this job on a Model 100 and have since replaced it with a 1400 HD, which I use with a CGA monitor, 1200 bps modem, etc. Nobody on this beat knows more about computers, has more interest in them or has a better portable than me.

I have subscribed to your informative magazine for three years or so and I have followed with great interest your trials and tribulations. But I must say I thought you were basically pandering with your "ROM with a View" (I DO like that title!) in the February 1992 edition. I feel I'm underpaid at \$10/hr. in my present job and have had at least one person agree with me — the guy who wants to buyout the publication I work for and keep me on board.

Tell me again why anybody would want to write for your publication and receive basically no compensation. I'm sorry if you find this message too sarcastic. But I really did read your editorial and ask my wife: "Why would anybody do that?"

Thanks for letting me do what many of my readers do to me — sound off.

AL PAHL, *Packer Report*, Managing Editor, BBS

Consider, why would anyone write and release a *Public Domain* program? Same rationale. In addition, have you ever heard of "publish or perish" in academia? Or starting a career with samples of your published work? And there are professionals in many occupations who want to "show-off" to their colleagues (they get a kick out of seeing their names in print).

-tk

WHAT'S HAPPENING?

The letter in the March 1992 issue written by Paul Hutchinson could have very well been written by me. I too purchased an 1100FD almost two years ago and am still making payments on it. I have asked Radio Shack about an upgrade to the hard disk and received the glassy-eyed stare they reserve for what they consider stupid questions. I have also seen the price markdowns.

Before buying from Radio Shack, I had asked friends and co-workers about Tandy computers. The response was always, "buy on sale and get mad later!" On top of that, I have yet to get a purchased piece of software to work prop-

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erly in the 1100FD. I was told by one dealer that none of the Tandy machines are "100% compatible."

The only thing I can do is resolve to NEVER again buy Tandy products. I started out in the computer world in the Apple orchard and that's where I'm going back to.

Michael Birchard
LaGrange, TX

I'm sorry to say that the other companies are no better. Just try telling IBM that it's not fair to drop the price the day after you bought your machine! And you cannot blame Tandy for the "March of Progress." Remember, 10 years ago, a 16K computer and monitor cost \$1000. No DOS, either. With computers, you know the price will drop and that today's \$3000 computer will sell next year for \$1500 or less. The only reason to buy one today is that you know you NEED it today and can't wait until a better unit appears later.

As for compatibility, not even IBM will guarantee that each new computer will run the previous machine's software correctly. If IBM can't make a new model that is IBM-compatible, what chance does their competition have? On the other hand, I've used quite a few pieces of software on the 1100FD without complaint, including WordStar 6 Laptop and dBase III+.

-tk

FURTHER INFORMATION ON "DEALING WITH DUPLICATION"

The numbers -1617 to -1400 are the ones used by Larry McInteer in his program "The Last Lister" (cited at the end of my article.) My method of converting these to "real" numbers is to add 65535 (the product of 64*1024).

If we use these numbers, the first name we PEEK (at -1617, or 63919) is not part of the Directory *per se*. (It appears to be the name of the BASIC program which was last edited.) Since the first (FileType) byte of this block does not contain a 192 (.DO file), it does no harm to scan this name. The IF statement will reject it, and it will not show up on the screen.

The beginning PEEK could be changed to 63930 or (-1606) without changing the way the program works. This would save us from looking at an 11-byte block which we will not use.

For the ending address, Mr. McInteer used -1400 (64136). My PEEKing into Model 100 memory tells me that the last filename in the directory actually starts at 64128 (-1408). Once again, however, his version does no harm, since looking past the end of the directory (even to the block starting at 64139, or -1397) only scans bytes which the IF statement will ignore as lacking the proper FileType number.

I do not usually use negative numbers myself. The only reason I used them here was that Lines 40 and 41 are taken almost directly from Mr. McInteer's program (which is why I was careful to credit him), and I am very much opposed to plagiarizing or misquoting anyone else's work. I think, though, that it might be simpler for all concerned if we just threw out all the negative numbers and used the positive numbers throughout.

I still can't find the source I used for the Model 200 number. My recollection is that I got the figures from an article in *Portable 100* which compared memory locations in the two machines. But I've gone through my back issues (twice) and I can't seem to find the article.

Ken Arbuckle
Portland, OR

Here's a recap of the numbers mentioned, and a copy of the BASIC program Ken used to look at filenames:

-1617	63919
-1606	63930
-1408	64128
-1400	64136
-1397	64139

1 'Displays ALL Filenames in Directory Area.

5 CLS

25 FOR I = 63930 TO 64139STE
P 11

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```
32 FOR J=I+3 TO I+10:PRINTCH
R$(PEEK(J));:NEXT:PRINTSPACE
$(2);
36 NEXT:RETURN
```

-mn

ARTICLE INDEX

What is the current price of your article index and would it have the computers covered by the article? (I have a 600.)

D.G. Smith
Johnstown, PA

Current cost of the Article Index is \$9.95.
Yes.

-tk

RAM EXPANSION ON THE MODEL 100

I read in I/O (April 1992) where Trevor Robinson was seeking to modify an XMODEM program for the Model 100 to use an external modem at 1200 baud. I use XMODEM.CO (2900 bytes), derived from XMDLDR.100 (8909 bytes) downloaded about three years ago from the Portable 100 BBS. It allows setting baud rates up to 19,200 via the usual telcom functions, the use of the internal modem at 300 and external modems higher (I have personally used only 1200), the usual telcom upload/download functions, and standard XMODEM func-

tions. I have never had any difficulty with this program.

About four years ago, I purchased a PCSG Super ROM. I have often used the text formatter, spreadsheet and database functions, but I have no use for the outliner (thought processor) function. I inquired several years ago whether that function might be replaced in my Super

Is it still possible to do this?

ROM by the Disk+ function. PCSG replied that it was, but for personal reasons I was unable to pursue replacement at that time. Would it be possible for this to be done now? If so, would PCSG do it, or would it be done by Tri-Mike Network East, which I understand is the distributor for these products.

Is there currently available any product to expand the RAM on the M-100 to multiple 32K banks, between which the computer can be switched? Is there a product that will allow such RAM to be

used in conjunction with one or more option ROMs, e.g., Super ROM, Cardfile ROM, Sardine ROM? I would appreciate names of vendors and current prices.

Bill McWeeny
Huntsville, AL

Yep, TMNE would be the ones to contact about replacing Outliner with Disk+. And TMNE might be able to help you with the banked RAM for your Model T.

-tk

TROUBLE WITH TYPE-INS

Recently I wrote that I was having trouble running your type-in programs. I have a Model 120 and the machine is in top condition, so it isn't the equipment. If your other readers are having no trouble, then I must be doing something wrong. We've gone over the listings... over and over... and find no errors.

Today I typed in the very short ECON.BA program and I can see it's a nifty program, except for one thing: When I try to input amounts for it to figure, it only accepts one numeral and at the next attempt to add to it, it makes a zero spring up. For instance, in the space where we have 0.00, I can only input one digit in front of the decimal, and nothing else. I've gone over the listing so much, I practically know it by heart. Can you please give me a clue?

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I actually like typing in programs, but if I can't get this one to work, I'm through with *Portable 100* type-in programs. I'm very accurate, so others must be having the same problem. Can you help me?

**Ferol Austen
Moody, ME**

I am sorry you had difficulty in getting ECON.BA running, but don't give up on *Portable 100*. They do a good job in translating listings. As usual, you have to be very careful about zeros and figure O's, and ones and lower case L's. I have double checked the listing presented in the magazine and find no errors, except for a bit of confusion in lines 1 and 3. In line 1, at the end, J1 should equal four hyphens. In the middle of the third line of line three, the "—" should be two hyphens in quotes. In the sixth line of line 3, "—" should be three hyphens in quotes. Magazine print tends to run the hyphens together and it is difficult to tell how many there are. But this should only affect the appearance of the screen and how things line up left to right.

Your problem is undoubtedly somewhere in line 19 where the input data is built into a string of characters. W is the complete string, and V is the last input character. Lines 16 through 18 have sorted out the question of deciding if the input character was a Clear, Quit, Menu, cursor up or down or carriage return. Line 18 decides whether the character was a delete, and if so,

shortens the string W. If not, then it decides if the character was a number or a decimal. If the program gets as far as line 19, then the character must have been a number or a decimal.

Because you seem not to be able to accept more than one character, there is something wrong in either the W=W+V

**They do a good
job in translating
listings.**

statement, or F(E)=VAL(W). The rest is supposed to take care of numbers too big to handle by forcing a cursor down character and a return to line 17, which then leads to the cursor handler in line 21.

There is one other thing that might be wrong, and that is in line 1 where the strings were dimensioned with DEFSTR J-Y. If W is not defined as a string variable, then you will

get a Type Mismatch error as soon as you enter any data.

My best guess is that you substituted a V for a W in line 19 F(E)=VAL(W).

As the listing is shown, the program will accept negative numbers, which is usually silly. Line 18 should be changed to say ELSEIF A<46 etc. instead of IFA<45. The program does not correct for overflow errors, so if you enter a combination of data that would cause the answer to exceed the numerical limits of the computer, then an Overflow Error is created and the program stops. This can be trapped by added a few more bytes to the program. In line 1, add at the beginning just before DEFSTR, ONER-RORGOTO40:

Then add a new line: 40IFERR=6 THENBEEP:RESUME16

This traps the error without stopping the program and returns you to the last cursor position. You must then change some data to get a problem that the computer can handle with an answer somewhere between its range of $\pm 10^{-62}$ to $\pm 10^{62}$. The display stays the same so you can inspect what you have done to startle the computer so. There is no more room on the display of the 100 or 102 to add any explanation, so all you have to tell you something is wrong is the beep.

Hope this solves your problem.

Matt Russel



COMPATIBILITY:

Model 100, 102, 200 (untested).

XYDATA — A Statistics Program For Data

Use this small program to run statistical analyses on your data.

by Jim McBurnett

Computers are great for generating numbers. Lots of numbers. But where is the computer when you need to analyze those numbers? You can make it help you with this often frustrating task. Here is one approach to data analysis that can help.

The Model 100/102 has an operating system that makes it especially attractive for both generating and analyzing data. More specifically, the ability of this computer to read or generate data in the form of document (TEXT) files is a very large plus.

XYDATA (see Listing 1) does limited statistical routines on data. When running trim (no remarks, extra spaces, etc.), it occupies about 2,100 bytes. It includes five elementary routines that perform common statistical operations on data.

They calculate rolling averages of sequential data; find the maximum, minimum, average, and standard deviation; generate histogram information on up to one hundred equally spaced

XYDATA does limited statistical routines on data.

intervals; plot to the LCD using linear coordinates; and perform linear regression analyses using any one of four models.

The program uses the ability of the Model 100/102 to access data files that are in document form. This has some obvious advantages. For example, you can easily enter and edit the data points in the TEXT mode without burdening the program. And, as you know, you may create document files from tape or disk files, by DOWNloading while in TELCOM, or by a suitable program for data acquisition.

Once entered, you can use any file by OPENing for INPUT. A convenient feature of the program is that you need not know the number of data points prior to executing any of the routines.

Figure 1 illustrates the flexibility provided by storing data in document files. Notice that there are five routines in XYDATA.BA. Each of the first three (1 Smooth, 2 MaxMin and 3 Histogram) requires only one data file. Notice also that 1 Smooth

```

2 DIM Y(100)
4 CLS:CLOSE:PRINT "1 Smooth",,"2 MaxMin"
,,,"3 Histogram",,"4 Plot",,"5 Best Fit",
,"6 MENU":INPUT "Choice";C1
8 CLS:ON C1 GOTO 10,100,210,310,510,9
9 MENU
10 INPUT "Source File,Result File";S$,D$
:INPUT "#Pts/Pt(2-100)";N:M=1/N:S=0
20 OPEN S$ FOR INPUT AS 1:OPEN D$ FOR OU
TPUT AS 2
30 FOR I=1 TO N:INPUT#1,Y(I):S=S+Y(I):PR
INT#2,S/I:NEXT
40 FOR I=1 TO N:S=S-Y(I):PRINT#81,I
50 IF EOF(1) THEN 4
60 INPUT#1,Y(I):S=S+Y(I):PRINT#2,S*M
62 NEXT:GOTO 40
100 INPUT "File";X$:B=10^50:A=-B:OPEN X$
FOR INPUT AS 1:I=0:S=0:T=0
120 IF EOF(1) THEN 170
130 INPUT#1,Y:I=I+1:PRINT#12,I;Y:S=S+Y:T
=T+Y*Y
140 IF A<Y THEN A=Y:D=I
150 IF B>Y THEN B=Y:E=I
160 GOTO120
170 PRINT "Max=";A;"e";D:PRINT "Min=";B;
"e";E:PRINT "Avg=";S/I:PRINT"Std Dev=";S
QR((T-S*S/I)/(I-1))
180 PRINT:PRINT "(SPACE BAR) to cont."
190 IF INKEY$="" THEN 190 ELSE 4
210 INPUT "Source File, Result File";S$,
D$:OPEN S$ FOR INPUT AS 1:OPEN D$ FOR OU
TPUT AS 2
220 INPUT# of Int'vals";M:INPUT"Lower,U
pper Limits";S,T:N=M/(T-S)
230 CLS:PRINT "Wait...":FOR I=1 TO M:Y(I
)=0:NEXT
240 IF EOF(1) THEN 270
250 INPUT#1,Y:PRINT#10,Y:L=1+INT(N*(Y-S
)):IF L<0 OR L=0 OR L>M THEN 240
260 Y(L)=Y(L)+1:GOTO 240
270 FOR I=1 TO M:PRINT#2,Y(I):NEXT:GOTO
180
310 INPUT "LINE(1) SCATTER(2)";T
315 G=38:H=61:INPUT "X File,Y File";X$,Y

```

Continued.

Listing 1. XYDATA.BA, a program that does limited statistical routines on data.

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```
$:INPUT "Xmin,Xmax,Ymin,Ymax";A,B,C,D :E
=200/(B-A):F=H/(D-C)
320 INPUT "X Grid Int.,Y Grid Int.":K,L:
CLS:PRINT Y$," Vs. ",X$
330 FOR I=0 TO (B-A)/K:LINE(G+I*E*K,H)-(
G+I*E*K,1):NEXT
340 FOR J=0 TO (D-C)/L:LINE(G,1+H-J*F*L)
-(238,1+H-J*F*L):NEXT:X1=0
345 IF X$<"COUNT" THEN OPEN X$ FOR INPU
T AS 1
355 OPEN Y$ FOR INPUT AS 2:IF T=1 THEN G
OSUB 380:PSET(X,Y)
360 IF EOF(2) THEN 400
370 GOSUB 380
372 IF T=1 THEN LINE-(X,Y) ELSE LINE(X-1
,Y-1)-(X+1,Y+1),1,B
374 GOTO 360
380 IF X$="COUNT" THEN X1=X1+1 ELSE INPU
T#1,X1
390 INPUT#2,Y:X=G+E*(X1-A):Y=1+H-F*(Y-C)
:RETURN
400 PRINT@201,"Any":PRINT@241,"KEY..";
410 IF INKEY$="" THEN 410 ELSE4
510 A$="1. Linear Y=AX+B":B$="2. Power Y
=A(X^B)":C$="3. Exponential Y=A[e^(BX)]"
:D$="4. Logarithmic Y=A+B*LOG(X)"
520 INPUT "X File,Y File":X$,Y$
530 IF X$="COUNT" THEN 535 ELSE OPEN X$
FOR INPUT AS 1
535 OPEN Y$ FOR INPUT AS 2:P=0:Q=0:R=0:S
=0:T=0:N=0
541 CLS:PRINT A$,B$,C$,D$,"5. Menu":INPU
T "Choice":J
612 IF J=5 THEN 4
613 CLS:PRINT "Wait.."
614 IF EOF(2) THEN 621
615 INPUT#2,Y:N=N+1:IF X$="COUNT" THEN X
=N ELSE INPUT#1,X
616 ON J GOTO 620,617,618,619
617 X=LOG(X):Y=LOG(Y):GOTO 620
618 Y=LOG(Y):GOTO 620
619 X=LOG(X)
620 P=P+X*Y:Q=Q+X:R=R+Y:S=S+X*X:T=T+Y*Y:
GOTO 614
621 CLOSE:U=(P-Q*R/N)/(S-Q*Q/N):V=R/N-U*
(Q/N):W=(P-Q*R/N)^2/((S-Q*Q/N)*(T-R*R/N)
):CLS:PRINT:ON J GOTO 624,625,626,627
624 PRINT A$:A=U:B=V:GOTO 628
```

Continued.

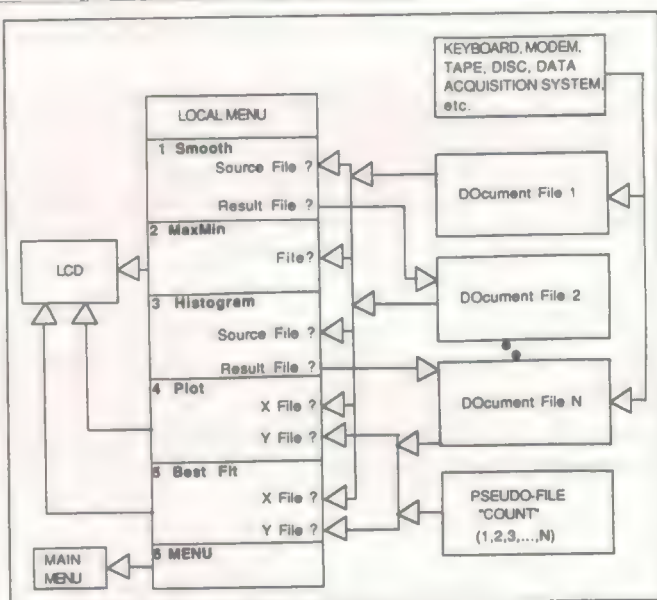


Figure 1. This shows an overview of the program XYDATA, illustrating its flexibility by storing data in document files.

and 3 Histogram create new data files, which contain the results of these routines. The routines 4 Plot and 5 Best Fit require two data files as inputs, although one of these may be the pseudofile COUNT. More on this later.

LOCAL MENU

Lines 2 through 9 cause a local menu (see Figure 2) to appear on the screen. Line 2 dimensions the variable array, Y(), to a maximum of 100 elements (points). This array is used in the rolling average and in the histogram routines. Selecting option

- 1 Smooth
- 2 MaxMin
- 3 Histogram
- 4 Plot
- 5 Best Fit
- 6 MENU
- Choice?

Figure 2. The local menu that runs XYDATA.

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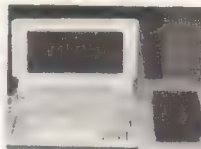
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6 MENU returns the user to the Model 100/102 menu (line 9).

ROLLING AVERAGE

Lines 10 through 62 comprise the rolling average routine (1 Smooth), which allows the use of as few as two points or as many as one hundred points in each average calculation.

You designate a source file, S\$, which contains the data points for smoothing. The rolling averages are written to file D\$, a document file you name, which other program routines such as MaxMin or Plot can subsequently use. The values in the original data file remain unchanged.

If you select 1 Smooth, Figure 3 illustrates the local menu and example inputs. In this example, POINTS is the TEXT

Source File, Result File? POINTS, SMPTS
#Pts/Pt (2-100)? 5

Figure 3. The local menu and some example inputs to show how the program works.

file read by the rolling average routine. The results are written to TEXT file SMPTS. Figure 4 provides a look at both the source and result files. Note that the jth point in the result file is the average of itself and the previous N-1 points in the source file, where N is the user-selected number of points per point (5 in this example).

MAXIMUM, MINIMUM, STANDARD DEVIATION

Lines 100 through 190 contain a routine that reads data from a selected document file and finds the maximum value (and where it occurs), the minimum value (and where it occurs), the aver-

"POINTS.D"	"SMPTS.D"
20.5	20.5
20.1	20.3
20.7	20.43333333
20.5	20.45
20.7	20.5
20.1	20.42
20.3	20.46
20.9	20.5
20.6	20.52
20.4	20.46
20.8	20.6
20.4	20.62
20.1	20.46
20.1	20.36
20.4	20.36
20.7	20.34
20.0	20.26
20.4	20.32
20.6	20.42
20.4	20.42

Figure 4. The source and result files from an example run of XYDATA.

```
625 PRINT B$:A=EXP(V):B=U:GOTO 628
626 PRINT C$:A=EXP(V):B=U:GOTO 628
627 PRINT D$:A=V:B=U
628 PRINT "A=";A:PRINT"B=";B:PRINT"Cor.
Coef.=";W:PRINT:PRINT"(SPACE BAR) To Con
t."
```

```
629 IF INKEY$="" THEN 629 ELSE 530
```

End of listing

age, and the standard deviation of the data in the file.

As it executes, the routine displays the number of data points in the file and the current value being read. After the MaxMin routine finishes, the total number of data points and the value of the last point remain on the screen. This routine is useful for finding the maximum and minimum of data for use in the Plot routine.

Figure 5 uses the data from text file POINTS.DO and displays the maximum (20.9 at point number 8), the minimum (20 at point number 17), the average (20.435), and the standard deviation (0.26011131220468). Note that the routine shows that there were 20 points and that the value of the last point was 20.4. Pressing the space bar returns the program to the local menu.

```
File? POINTS 20 20.4
Max= 20.9 @ 8
Min=20 @ 17
Avg= 20.435
Std Dev= .26011131220468
(SPACE BAR) to cont.
```

Figure 5. The result of the procedure 2 MaxMin on the data in the file POINTS.DO.

HISTOGRAM

Lines 210 through 290 contain the Histogram routine, which reads data from a selected document file and performs a count on the number of occurrences in each of a number of equally spaced intervals. You must designate the number of intervals, which may be up to one hundred.

This routine also creates a document file, which you designate, containing the results of the histogram routine. These results may subsequently be plotted by the Plot routine or may be printed to an external printer, the same as any other TEXT file.

Figure 6 summarizes the Histogram routine prompts and the

typical user inputs. This example uses the data file *POINTS.DO*. After the routine executes, you can return to the Model 100/102 menu (6 *MENU*) and examine the document file *HISTGM.DO*.

This file contains the results as number of occurrences over the five equally spaced intervals from 20 to 21. Note that the first number in the file is 5. This means there are five numbers in the source file *POINTS.DO* equal to or greater than 20.0 but less than 20.2.

Source File, Result File? **POINTS, HISTGM**
 # of Int'vals? **5**
 Lower, Upper Limits? **20,21**

Figure 6. A summary of the histogram routine prompts and some typical user inputs.

PLOTTING

Lines 310 through 410 contain the *Plot* routine, which uses the LCD to display either a line or a scatter plot of the values in one data file versus those in another. Screen prompts are used for selecting a *LINE* or *SCATTER* plot, the X data file name (abscissa), the Y data file name (ordinate), X-axis lower and upper limits, Y-axis lower and upper limits, and the X-axis and Y-axis grid intervals.

To allow the largest possible size for the plot, no scale values are given for the grid lines. When you need to plot only Y data points sequentially (against arbitrary X data values), entering the X data file name *COUNT* (a dummy file name in all caps), eliminates the need to create an X data file (which would consist only of the numbers 1,2,3, ..., N anyway).

When the program encounters the dummy name *COUNT*, it automatically increments the X value as the plot progresses.

To illustrate the plotting capabilities, Figure 7 represents a

Test Data, 100 degF, 1800 RPM		
PRESSURE, PSI	TORQUE, LB-IN	FLOW RATE, GPM
259	428	48.7
501	699	48.3
751	991	48.1
1003	1278	47.9
1249	1565	47.8
1502	1861	47.6
1752	2158	47.3
2005	2459	47.0
2252	2760	46.7
2501	3090	46.4

Figure 7. A plot from a sample laboratory test, showing input torque versus discharge pressure.

"PSI.DO"	"TRQ.DO"	"FLOW.DO"
259	428	48.7
501	699	48.3
751	991	48.1
1003	1278	47.9
1249	1565	47.8
1502	1861	47.6
1752	2158	47.3
2005	2459	47.0
2252	2760	46.7
2501	3090	46.4

Figure 8. The original data set for the plot shown in Figure 7.

LINE(1) SCATTER(2)? **2 (ENTER)**
 X File, Y File? **PSI, TRQ (ENTER)**
 Xmin,Xmax,Ymin,Ymax? **0,3000,0,3500 (ENTER)**
 X Grid Int., Y Grid Int.? **500,500 (ENTER)**

Figure 9. The results of the 4 Plot routine from the local menu of XYDATA.

data set from a laboratory test. In this example, the plotting routine is used to plot input torque (*TRQ.DO*) versus discharge pressure (*PSI.DO*). Note that the original data set has been separated into three document files, as shown in Figure 8.

Figure 9 illustrates the results of selecting 4 *Plot* from the local menu. The differences between *LINE(1)* and *SCATTER(2)* are shown in figures 11 and 10.

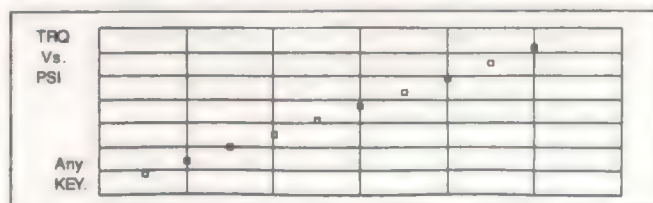


Figure 10. The results of the SCATTER(2) routine.

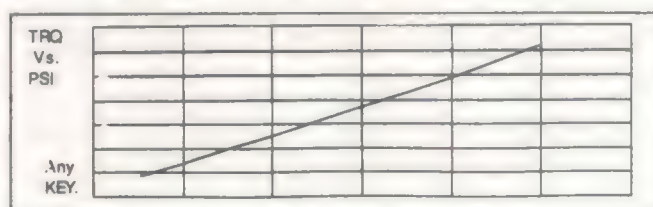


Figure 11. The results of the LINE(1) routine.

BEST FIT

Lines 510 through 629 contain the *Best Fit* routine, which uses the method of least squares and allows up to four models for an attempted fit. The four models available are *Linear* ($Y=A \cdot X+B$); *Power* ($Y=A \cdot X^B$); *Exponential* ($Y=A[e^{(B \cdot X)}]$); and *Logarithmic* ($Y=A+B \cdot \ln(X)$).

In each case, the values of the coefficients *A* and *B* are given along with the correlation coefficient. The "goodness" of the attempted fit is indicated by the value of the correlation coefficient. The closer it is to 1.0, the better the fit. The program does

X File, Y File? **PSI,TRQ (ENTER)**

Figure 12. Result of selecting "5. Best Fit".

1. Linear $Y=A \cdot X+B$
 2. Power $Y=A \cdot (X^B)$
 3. Exponential $Y=A[e^{(B \cdot X)}]$
 4. Logarithmic $Y=A+B \cdot \ln(X)$
 5. MENU
- Choice? **1 (ENTER)**

Figure 13. Menu presenting choice of models.

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Circle 154 on reader service card.

1. Linear $Y=AX+B$

$A=1.1809670755598$

$B=102.1178534164$

Cor. Coef.= .99967287566593

(SPACE BAR) To Cont.

Figure 14. The results of the equation $Torque = 1.180967 * Pressure + 102.118$

not compute residuals.

You can easily use the same data files used for the plot routine to illustrate the 5 Best Fit option.

The plot of torque versus pressure strongly suggests that the relationship is linear. You may try each of the four available models, and you may select the model that has a correlation coefficient closest to 1.0. The objective is to find an equation that may be used to predict the torque required for this pump at pressures other than those reported from the test lab.

The results shown in Figure 14 suggest that the equation given by

$$Torque = 1.180967 * Pressure + 102.118$$

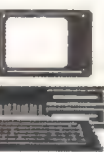
might be used to predict required input torques at pressures other than those reported by the test lab. Had you used the FLOW.DO file instead of TRQ.DO, you might have found an equation fores-

ed TEXT files or to the LCD. If a printer is available, you can edit the appropriate lines to direct the output to a printer with a parallel interface by changing PRINT commands to LPRINT.

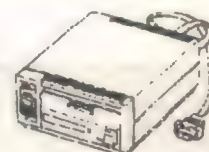
To save RAM space, there are no error traps. Also, there may be as many as two files open at once. Therefore, go to BASIC and execute MAXFILES=2. Otherwise, you may be greeted by ?BN Error in . . .

Prior to executing the program, create the necessary data files by selecting TEXT from the Model 100 menu, name the file, and enter the data points.

You may select any name you wish for the program. I prefer XYDATA. The program appears on the MENU under XYDATA.BA and executes immediately by placing the cursor over the name and pressing the ENTER key. The local menu is then displayed and offers the options available.



PC-PDD



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timating the flow rate of the pump at any pressure.

ADDITIONAL COMMENTS

As presented here, results of all routines are either printed to designat-

Continued from page 31

in will do the same job—more slowly, perhaps, but you don't need the cassette.

No PCSG ROM currently has this capability, though it may be added to Super ROM in the future.

PLEASE RELEASE ME, LET ME GO ...

These programs are all in storage here at TMN East. (I put 'em there ... again ... and again ... remember?) There's just one slight problem: Only one copy of documentation exists for each program. Simply photocopying them isn't practical, as some are quite large—TUTOR+ weighs in at 64 pages—and I hadn't yet found time to transcribe them for reproduction.

I guess now's the time, eh? Thanks for reminding me, Mr. Faulkner! I'll get right on it and re-release these li'l puppies soon ... with all the pomp my circumstance will allow.

Catch ya!



Mike Nugent is pretty weird. He can be reached at Tri-Mike Network East, P.O. Box 372, Peterborough, NH 03458, tel. (603)588-2010; on CompuServe (71426,1201); or MCI Mail (TMNEAST). If requesting a reply by postal mail, please enclose a SASE. (Mr. Faulkner did, and HE got a reply!)



COMPATIBILITY:

All computers.

Simple and Easy Home Publishing

You can publish newsletters with your computer and printer.

by Richard Ramella

You can become a publisher. For twenty years I worked as a newspaper editor. These days, I'm a writer for a California hospital. The people I write to comprise a variety of specialized audiences, including even microcosms within subcultures. So I'm often asked to turn out newsletters appealing to special groups. Thanks to my portable computer, these projects have never been simpler. And whether you plan a multipage report in journalistic style, a cafe menu, a Cub Scout newsletter, or a direct mail appeal, you can profit from what I'll cover here.

FIVE STEPS TO SUCCESS

The secret to turning out a newsletter is contained in five steps:

- In your mind and on paper, sketch a rough plan of your publication.
- Write all the articles in a text file.
- Line print the file in a column 3.5 inches wide.
- Trim type, headlines, and illustrations and paste material on a page in a way you like.
- Reproduce the layout as many times as you want.

Yes, I left out a lot of important details in this simple list. The list will serve as a step-by-step template as I slowly go through the process.

Concept, production, and reproduction, these are the basic steps used in any publishing process.

CONCEPT

You should have a good idea of how much space your words and illustrations will cover. Producing a many-paged

publication is a matter of doing one page at a time, but it can run up costs. To start, keep it simple, perhaps the front and back of a single sheet of paper.

If you're producing a newsletter, it needs a name, which should be printed in the largest type size used in the publication. The name and such information as date, volume number, and address are called the masthead. For an example of a masthead, turn to the cover of this magazine and note how the name *PORTABLE*

Put all articles for one publication in a single text file.

100 stands out. You might consider drawing the masthead in large type or using your firm's logo if it has one.

The next step is relatively vague. Consider how much space you have left after the masthead is in place. Then come up with enough material to fill it—easier said than done!

WRITING

If you're a beginner and have a Model T, the following can help you get started: Turn on the Model T. You're in menu mode, where the word *BASIC* in the upper left corner has reversed letters with a dark cursor over it. Press the right

arrow key and the dark cursor should move right to cover the word *TEXT*; press *ENTER*. A prompt appears, reading *File to edit?* Your answer must be in six or fewer characters and becomes the name of the text file. Answer the prompt and press *ENTER*.

If you have an MS-DOS computer, you'll need to refer to your DOS and word processor manuals for instructions on how to start a text file.

Now type material into the file.

I suggest all articles for one publication be put in a single text file. At the top of each article, type a two- or three-word description, or *slug*, you can remember. Later, you can use the string search function to find specific articles quickly.

If all the material for one publication exceeds the capacity of your computer, save the material to disk or cassette tape for later use, and continue writing in a new file.

LINE PRINTING

Let's look at your particular printer. The aim is to have the printer format your article's type in a column that is 3.5 inches wide. Two such columns fit neatly side by side on standard 8.5-inch wide paper.

On the Model T keyboard, depress the *SHIFT* key and the *PRINT* key at the same time. A prompt should appear at the bottom left of the screen, asking for *Width*. Type *40* and press *ENTER*. The printer should print the file on paper. Measure the width of the column of printed type. You're hoping it's about 3.5 inches wide. If so, your printer is printing at about twelve characters per inch, perfect.

If the column width is less or greater than 3.5 inches, refer to the printer man-

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When we designed *Disk +* we did it out of necessity. We wanted a way that we could just connect a Model 100 to our desktop computer with a cable and save files onto the desktop's disk drive. We wanted it to be so simple to use it would be self-explanatory.

Picture this. *Disk +* comes to you on a Snap-in ROM and a diskette for your desktop. You take a quarter and open the little compartment on the back of your Model 100. Then you just press the ROM into the socket. *Disk +* appears on your main menu just like a built-in.

You connect your Model 100 to your other computer using an RS232 cable (available from TMNE for only \$20).

You just place the *Disk +* diskette into the desktop's drive and turn on the computer. It powers up automatically and says "awaiting command" on your desktop's screen. Then you just put the widebar cursor on the Model 100 main menu on *Disk +* and press ENTER. You are shown your RAM files arranged just like the main menu.

To save a file to your other system's disk drive, you just move the widebar cursor to the file you want to save and press ENTER. It is saved instantly with no further action.

To look at the disk directory, you just press a function key on your Model 100. You see immediately the disk directory on your Model 100 screen, and it is arranged just like your Model 100's main menu.

To load a file from the diskette to your Model 100, you just move the widebar cursor to the file and press ENTER. The file is transferred to your Model 100's RAM instantly. You can press F8 and go back to the main menu, and the file you loaded from diskette is there, ready to use.

It is so nice to be able to keep your documents, programs (both BASIC and machine code) and *Lucid* spreadsheet files on the diskette, and bring them back when you need them. All files are ready to run or use with no changes or protocol by you.

If you have access to a desktop computer and don't have *Disk +*, then evidently we have done a poor job telling you about it.

All files and programs that you load or save, go over and come back exactly as they are supposed to be because of full error checking. This guaranteed integrity is really a comfort. *Disk +* is wonderful in so many other ways. For example, you can do a "save all" of all your RAM files with just a touch of a function key. That group of files is saved on the diskette under a single filename with a .SD (for subdirectory) extension. Any time you want, you can bring back all those files at once, or just one or two if you like, again with one-button ease.

Disk + takes up no RAM. That's zero bytes either for storing the program or for operating overhead.

What really excites most *Disk +* users is text file cross compatibility. Your Model 100's text files are usable on your desktop computer, and your desktop's text files become Model 100 text files.

This means you can write something on your Model 100, and with *Disk +* transfer it

instantly to your desktop and start using it right away on your bigger computer. Or the way we like to work is to type in a document on the desktop computer and then transfer it to our Model 100 with *Disk +*. Then we print out the document, beautifully formatted, using WRITE ROM.

Disk + works with just about every micro sold, from IBM PC and its clones, to all Radio Shack computers (yes, all), to Apple II, Kaypro, Epson and most CPM. Just ask us. More than likely, your computer is supported.

Incidentally, hundreds of Model 100 owners have gone to their Radio Shack stores and bought a color computer because it is so low priced, and with *Disk +* they have an inexpensive disk drive.

And if that weren't enough, how about this: *Disk +* also provides cross-compatibility between different computers like IBM, Apple or the Model 4 using the Model 100 as the intermediary device. Quite a feature!

The snap-in ROM is really great because you can use other ROMs like *Lucid* or WRITE ROM. They snap in and out as easily as an Atari game cartridge and you never lose your files in RAM.

Anyone who ever uses *Disk +* simply can't do without it. But so many times we have had new users call us and say, "Wow! I had no idea when I ordered it that *Disk +* would be so fantastic. I just couldn't believe that I could use my desktop computer's disk drive with my Model 100 just like it is another main menu."

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ual. Look for material on *cpi* (characters per inch). Most printers have some way of varying type width. Some dot-matrix printers can scale type width up and down between two extremes. Some letter-quality, daisy-wheel printers offer 10 and 12 characters per inch, as well as proportioned spacing of letters.

For MS-DOS word processors, you can usually vary the left and right margins until they similarly deliver a 40-column line in 3.5 inches. Depending on the exact word processor and printer you use, your word processor might let you select a printer font that gives you forty characters in 3.5 inches.

If your printer won't in any way translate a width of forty characters into 3.5 inches, all you can do is print the columns in another width. Go back to the test text file and experiment, printing in different widths until you find the magic 3.5-inch column on your line printer.

RAGGED RIGHT

The Model T prints in a style where the left edge is straight but the right is not. I think this is aesthetically superior to word-processing programs that justify type within a line to make an even right margin. Such maneuvers tend to put too much space among the letters and words, creating a rather gawky look. Fortunately, these word processors also let you turn that right justification off when you don't want it.

If you can print a 3.5-inch column adhering to the 40-character width on the text screen, you can easily hyphenate words because the type's screen appearance is the same as it'll be when it's printed. Hyphenating saves space and makes the right edges of the type more even. Breaking words between lines isn't good style in manuscripts, theses, or reports, but it is just dandy in journalism.

Before you dump the type to paper, there's one more point to cover. Some printers produce varying lines per vertical inch of printing: six, eight, ten, whatever (normal is six). Experiment here. It's a way to compress material or pad it, depending on your need.

PRINTED ELECTRONICS

Now you've written your clean copy; it's time to turn it into ink. If at all possible, use a carbon or fresh fabric ribbon on the printer. It'll help you get the best possible reproduction. (Laser printers, of course, give the most professional look.)

For the final steps, you'll need the following supplies. Even if you have to buy every item listed, I think they'll cost less than \$20.00.

TOOLS AND SUPPLIES

The first tool needed is for trimming paper. Some use a single-edge razor, with which they usually cut themselves. I recommend a wallpaper knife or an X-Acto knife.

You'll also need a ruler with a metal edge to guide you when cutting. Professional printers use a ruler called a *pica stick* or *line gauge*. A wooden ruler with a metal strip usually has the metal seated too high on the edge to be precise when cutting. A thin metal ruler is best and safest.

To paste down the paper type and other layout elements, use glue. For small jobs I recommend a Dennison Glue Stic, about ninety-nine cents. For big projects, use Scotch 3M Spray Mount — an artist's adhesive — for about \$8.00. The Glue Stic allows for easy

**If you plan
illustrations,
they should be
continuous line
art and not
photographs.**

unpeeling for repositioning type. Professional printers use wax machines, which spread an even coating of hot wax on the reverse of the paper to be pasted. Hot wax cost is high, and the wax can permeate porous paper and make it look dark. This gives poor photocopies.

Layout sheets help you keep all type and other material straight on the pasteup page. The mark of the bad printer is crooked type, which often isn't spotted until the job is complete. Layout sheets are gridded sheets printed in a pale blue ink that doesn't reproduce in the printing process. They're called *fade out blue grids*, and *non-repro blues* and are available in stationery and graphic supply stores. Buy the 8.5- by 11-inch size and expect to pay \$3.00 to \$6.00 for a pad of them.

Liquid Paper correction fluid costs less than \$2.00 and is nice for eliminating smudges.

44

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LAYOUT AND PASTEUR

When all of your type has been set on the line printer, use the cutter and the ruler to trim it as squarely as possible.

If you plan illustrations, they should be continuous line art and not photographs. This is important. Line art is made of black and white and has no shading—a cartoon, for example. A photograph has shading, elements of gray. Using a photograph calls for a halftone negative—a professional printing process that puts a tiny dot pattern in the art so it reproduces evenly but appears gray. Look at a newspaper photograph closely and you'll see the effect. Copying a photograph on a copying machine can be done with fair to marginal results, but offset printing reproduces only a sheer black and white version, which lacks the original's quality and shading.

For each page of your newsletter, place one sheet of layout paper on the work area. Now play with different illustration arrangements and the blocks of paper type. Room must be left for the masthead and headlines above the stories. As you arrange the two-column page, leave margins of about five-eighths of an inch on either side of the copy blocks. This provides a snug but ample white gutter between the two columns.

LAPTOP PUBLISHING

JIGSAW PUZZLE

If you have trouble getting your elements to fit the page, you can cut a four-inch story into two-inch parts, put them side by side, and run a headline across the top of the two columns.

Whole books have been written about layout style. What counts in your effort is that you arrange the material in an easy-to-read format.

If your newsletter is to be mailed, leave a blank area for the address so when the newsletter is folded for mailing, it will show.

Though it might not seem possible at first, you'll find you can eventually make all your material fit the allotted space. If you have too little, plan larger headlines and more white space around the stories. If you have too much, edit material judiciously and redump the paper type if necessary. You can shorten some stories just by cutting off the last paragraph. That's the way newspapers do it.

HEADLINER

When everything fits, you're ready to work on your headlines. Some line printers have dot-addressable graphics that with the right software allow for printing type in a variety of large fonts. The old Radio Shack Line Printer III prints type in a larger size simply with an *LPRINT CHR\$(31)*.

If you have a daisy-wheel printer, you might print body type in one font and use another font in all-capital letters for headlines. You could also use type that comes in a variety of sizes and styles on acetate sheets. Available at graphic art supply stores, these letters must be lightly cut from the sheet one at a time and pressed to paper. I use a brand called Formatt with good results. If you use acetate type, lay the headline on a separate sheet of blue grid paper. Then cut out the entire headline and lay it on the page you're assembling.

I presume you will use the Glue Stic or a similar product when doing the actual pasteup work. But before gluing, position all elements where they will be pasted, and the beautiful blue right angles of the layout grid become useful.

LINE UP AND SEND OUT

Establish a corner point for laying down the first element. Take the element and put it face down on a separate, clean sheet of paper. Lightly run the glue stick along each edge, letting the glue overlap onto the clean sheet. Next, describe an X in the center of the element with the glue and position the element where you want it. Look closely to be sure it's in line with the grid and its edge is at the margin you want. When you're sure, use the heel of your hand in a rolling motion to secure the element to the page. Rubbing smudges the type.

All pasted up, you're ready to mass reproduce. The most economical means of mass reproduction is usually your neighborhood "quick print" shop. You've produced camera-ready copy, which the print shop can reproduce using the offset method for approximately four or five cents a copy, depending on the number you order.

On the other hand, if the newsletter is going only to a few people within your organization, it's feasible to reproduce it on an office copy machine.

CONGRATULATIONS

You are now a publisher. With practice, you'll find it simple to put together what you want, and easy to estimate just how much space that 5,000-character article is going to need. You might even find yourself having fun!

Good luck.



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COMPATIBILITY: Tandy Model 100, 102, 200, and MS-DOS portables with BASIC

CHESS.BA

Let your portable be your chess partner!

by Jose R. Paz

Now that an 1100FD has become my portable workhorse, the M100 has become the fun and play computer. Mostly it is used as a controller for various projects or as a super sophisticated calculator.

One of its more frequent uses is as a keyer for Morse code work in ham radio, but the 10 meter band has been very bad lately. With time on my hands because of this difficulty, this little project came about. This chess playing program has some very nice features, including a user upgradeable opening table. It is no speedster and will lose to most opponents; but it is very useful to impress people with your chess abilities.

The program first initializes the data. This is accomplished by the SETUP BOARD routine. You are asked to make a selection about the color that you want to play (White or Black), then the board is drawn on the screen (BOARD ROUTINE). After the program asks you to enter your move (ENTRY POINT), the computer proceeds to make your move after checking for legality. It then redraws the board (BOARD).

The next step is for the computer to select a response to your move. First the computer checks to see if your move is in the opening library (OPENINGS LIBRARY). If the move is found it will look up the answer and will reply very quickly by making the move (MAKE MOVE) and redrawing the board. If the move is not found then the program calculates the computer response (ANALYSIS).

This part of the program (ANALYSIS) works as follows: first the program will check for pieces present on the board, (PIECE MOVE EVALUATION). If no king is found the program will resign. The program will at this point create a list of all the legal moves available to the computer using subroutines for each pieces (KNIGHT BISHOP ROOK etc.). After the list is created, then each move is evaluated (EVALUATE LIST OF LEGAL MOVES). This evaluation works as follows. The computer will assign a value to the square on the board to which the piece is going to move (STRATEGY) plus the value of the enemy piece occupying the square if any (VALUE OF PIECE TO BE EATEN). This numerical value is stored in the variable TV. The next step is for the computer to check whether making this move will endanger its king or queen (KING OR QUEEN DANGER) or other pieces (DANGER FACTOR FOR OTHER PIECES). This is done by checking for possible human counter moves (CHECK COUNTER MOVES). This counter move value is stored in the variable LV. LV is subtracted from TV and this value is compared to variable HV. If it is higher than HV, then the value in HV is replaced by the value in TV. This continues for the entire list of possible moves until at the end the highest value remains. That is the one that the computer selects to make

Continued on page 23.

```

1000 '100CHS.BA
1010 '* * * * * M-100 CHESS MAIN * * * *
1020 '
1030 '* * * * * SETUP BOARD * * * * *
1040 DIM B(9, 9), MV(33), PT(8), NN(2), B
B(2), RR(2)
1050 TP =1: CK =1
1080 M1$="":SA$="":CM$="":MO$="":D$="":
A2=0
1090 BP=97:WP=85:KEY OFF:RESTORE 1150
1100 CLS :PRINT " M-100 CHESS "
1110 PRINT " BY JOSE R. PAZ":FOR
I=1 TO 1000:NEXT: CLS
1115 PRINT :PRINT :INPUT "WANT TO PLAY W
HITE OR BLACK:", M1$
1117 IF LEFT$(M1$, 1) = "B" THEN CC =1
1120 FOR I=8 TO 1 STEP -1:FOR J=1 TO 8:IF I>
2 AND I<7 THEN B(J,I)=46:GOTO 1140
1130 READ B(J, I)
1140 NEXT: NEXT
1150 DATA 82,78,66,81,75,66,78,82,80,80,
80,80,80,80,80,80
1160 DATA 112,112,112,112,112,112,112,11
2,114,110,98,113,107,98,110,114
1170 GOSUB 10000:GOTO 1220
1190 '
1200 '* * * * * ENTRY POINT * * * * *
1202 F =1:IF CC =1 THEN F =0
1203 FOR I=1 TO X1+ Y1:F = F +1:IF F > 1
THEN F =0
1204 NEXT
1205 H =1:X= X1:Y= 9 - Y1: V =B(X, Y1):I
F CC =1 THEN X= 9 - X1
1206 GOSUB 10115
1207 F =1:IF CC =1 THEN F =0
1208 FOR I=1 TO X2 + Y2:F = F +1:IF F >
1 THEN F =0
1209 NEXT
1210 H =1:X= X2:Y= 9 - Y2: V =B(X, Y2):I
F CC =1 THEN X= 9 - X2
1212 GOSUB 10115
1220 X1=0:X2=0:Y1=0:Y2=0: HV = -9000:IF
T =1 THEN 1440
1230 T = T +1
1235 IF CC =1 AND CK =1 THEN 5000
1250 LOCATE 7, 18:PRINT "
"
1260 BEEP:PRINT@138,"ENTER YOUR MOVE:":C

```

Continued.

CHESS.BA is the Model T version. The MS-DOS version is available on the Portable 100 BBS.

Sardine: The only electronic dictionary for Model 100/102/200/NEC8201 computers. Contains the 33,000 word Random House Pocket Dictionary.

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Circle 33 on reader service card.

```
K
1270 PRINT@178,;:INPUT M1$
1280 IF M1$ = "O-O" THEN GOSUB 3150: H =
0:GOSUB 10110:GOTO 1220
1300 IF M1$ = "O-O-O" THEN GOSUB 3160: H
=0:GOSUB 10110:GOTO 1220
1330 IF M1$ = "" OR LEN(M1$) > 6 OR LEN(
M1$) < 5 THEN GOTO 1260
1340 D$ = LEFT$(M1$, 1):GOSUB 3260:X1= D
:Y1= VAL(MID$(M1$, 2, 1))
1350 D$ = MID$(M1$, 4, 1):GOSUB 3260:X2=
D:Y2= VAL(MID$(M1$, 5, 1))
1360 IF X1 < 1 OR Y1 < 1 OR X1 > 8 OR Y1
> 8 THEN 1260
1370 IF X2 < 1 OR Y2 < 1 OR X2 > 8 OR Y2
> 8 THEN 1260
1380 'IF RIGHT$(M1$,1)="C" THEN T=0:GOTO
1400
1385 IF CC =1 THEN Y1= 9 - Y1:Y2= 9 - Y2
1390 IF B(X1, Y1)= 46 OR B(X1, Y1) < BP
OR B(X2, Y2) > WP THEN 1260
1395 GOSUB 4000:IF LV =0 THEN 1260
1400 ' MAKE MOVE
1410 B(X2, Y2)=B(X1, Y1):B(X1, Y1)= 46
1415 IFB(X2,Y2)=112ANDY2=8THENB(X2,Y2)=1
13
1416 IFB(X2,Y2)=80ANDY2=1THENB(X2,Y2)=81
1420 PRINT :GOTO 1200
1430 '
1440 ' * * * ANALYSIS * * * * *
1450 IF NF =0 THEN GOSUB 2250:IF NF =0 T
HEN 1400
1460 PRINT@138,"THINKING" "":T=T+1
1470 IF T > 1 THEN T =0
1480 '
1490 ' * * * PIECE MOVE EVALUATION * *
* * *
1500 F =1:MC =0:GOSUB 2080:PP = KK:GOSUB
2830
1510 PP = NN(1):GOSUB 2570:PP = NN(2):GO
SUB 2570:PP =BB(1):GOSUB 2650
1520 PP =BB(2):GOSUB 2650:PP = RR(1):GOS
UB 2720:PP = RR(2):GOSUB 2720
1530 FOR X=1 TO 8:PP = PT(X):GOSUB 2910:
NEXT:PP = QQ:GOSUB 2790
1535 IF HV < -500 THEN 2210
1540 IF HV>0 AND HV<7 THEN GOSUB 3170:IF
F=1 THEN GOSUB 10110:GOTO 1220
1550 GOTO 1400
1560 '
1570 ' * * * EVALUATE LIST OF LEGAL MOVE
S * * * * *
1580 FOR Q =1 TO MC:IF MV(Q)=0 THEN 1610
1590 X3 = INT(MV(Q) / 10):Y3 = MV(Q) - X
```

```
3 * 10:GOTO 1630
1600 MV(Q)=0:PRINT@138,PRINT"THINKING "
1610 NEXT:MC =0:RETURN
1620 '
1630 ' * * * * * VALUE OF PIECE TO BE EAT
* * * * *
1640 E =B(X3, Y3):IF E = 46 THEN TV =0:G
OTO 1730
1650 IF E =112 THEN TV =16:GOTO 1730
1670 IF E =110 THEN TV = 35:GOTO 1730
1680 IF E = 98 THEN TV = 37:GOTO 1730
1690 IF E =114 THEN TV = 50:GOTO 1730
1700 IF E =107 THEN TV = 990:GOTO 1730
1705 IF E =113 THEN TV =130:GOTO 1730
1710 '
1720 ' * * * * * STRATEGY * * * * *
1730 X4 = INT(PP / 10):Y4 = PP - X4 * 10
: H =B(X4, Y4)
1740 IF KK = 58 AND (H = 75 OR H = 82) T
HEN TV = TV -4
1750 IF Y3 < Y4 THEN TV = TV +1
1760 IF (X3 = 4 OR X3 = 5) AND H = 80 TH
EN TV = TV +2
1780 IF B(X3 +1, Y3 +1)= 80 OR B(X3 -1,
Y3 +1)= 80 THEN TV = TV + 5
1781 IF H = 80 THEN 1800
1782 IF B(X4 +1, Y4 -1)=112 OR B(X4 -1,
Y4 -1)=112 THEN TV = H / 3
1784 'IF H=78 AND E=112 THEN TV=TV/3
1800 PRINT@138,""
1810 PRINT@178,""
1820 IF TV > HV THEN GOSUB 1860
1830 IF HV >= TV THEN 1600
1840 HV = TV:X1= X4:Y1= Y4:X2= X3:Y2= Y3
:GOTO 1600
1850 '
1860 ' * * * * * KING OR QUEEN DANGER * *
* * *
1870 PS =B(X3, Y3):B(X3, Y3)= H:B(X4, Y4
)= 46:GOSUB 1885:B(X4, Y4)=B(X3,Y3)
1880 B(X3, Y3)= PS:RETURN
1885 IF H = 75 THEN KV = -999:GOTO 1945
1890 KV = -999: TS = PP:PP = KK:GOSUB 19
70: TV = TV + LV:PP = TS
1905 IF H = 81 THEN KV = -99:GOTO 1945
1910 KV = -99: TS = PP:PP = QQ:GOSUB 197
0: TV = TV + LV:PP = TS
1930 ' DANGER FACTOR FOR OTHER PIECES
1935 KV = -H / 3
1940 IF H = 80 THEN KV = -8
1945 TS = PP:PP = MV(Q):GOSUB 1970: TV =
TV + LV:PP = TS
1950 RETURN
1960 '
```

Continued.


```

1970 ' * * * * * CHECK COUNTER MOVES * *
* * *
1980 PRINT@138,"THINKING "
1985 F =0:LV =0: E =0
1990 GOSUB 2720:IF LV < 0 AND (E =114 OR
E =113) THEN 2060 ELSE LV =0
2010 GOSUB 2650:IF LV < 0 AND (E = 98 OR
E =113) THEN 2060 ELSE LV =0
2030 GOSUB 2830:IF LV < 0 AND E =107 THE
N 2060 ELSE LV =0
2040 GOSUB 2570:IF LV < 0 AND E =110 THE
N 2060 ELSE LV =0
2050 GOSUB 3070
2060 F =1:RETURN
2070 '
2080 ' * * * * * CHECK PIECES PRESENT ON
BOARD * * * * *
2090 AR =0A:B =0A:N =0A:P =0: KK =0: QQ
=0:FOR X=1 TO 8:PT(X)=0:NEXT
2095 FOR X=1 TO 2:NN(X)=0:BB(X)=0:RR(X)=
0:NEXT
2100 FOR I= 8 TO 1 STEP -1
2110 FOR J=1 TO 8:PP = J * 10 + I:R =B(J
, I)
2120 IF R = 75 THEN KK = PP
2130 IF R = 81 THEN QQ = PP
2140 IF R = 82 THEN AR = AR +1:RR(AR)= P
P
2150 IF R = 66 THEN AB = AB +1:BB(AB)= P
P
2160 IF R = 78 THEN AN = AN +1:NN(AN)= P
P
2170 IF R = 80 THEN AP = AP +1:PT(AP)= P
P
2180 NEXT J:NEXT I:M1$ = "":IF KK =0 THE
N 2210
2190 CK = CK +1:RETURN
2200 '
2210 ' * * * * * ANOUNCES MATE * * * * *
2220 BEEP:BEEP:PRINT :PRINT :PRINT "OK.
I LOSE BUT I'LL GET YOU SOME DAY"
2230 END
2240 '
2250 ' * * * * * CHECK FOR BOOK OPENING *
* * * *
2260 RESTORE
2270 CM$=CM$+M1$:M1$="":FOR X=1TO200:REA
D MO$:IF MO$="END" THEN NF=1:RETURN
2280 IF LEN(CM$) >= LEN(MO$) THEN 2300
2290 IF LEFT$(MO$, LEN(CM$))= CM$ THEN 2
310
2300 NEXT: END
2310 MO$ = MID$(MO$, LEN(CM$) +1, 5):GOT
O 2500
2320 '
2330 ' * * * * * OPENINGS LIBRARY * * * *
*
2340 DATA E2-E4E7-E5G1-F3B8-C6B1-C3G8-F6
F1-B5F8-B4C3-D5F6-D5E4-D5E5-E4
2350 DATA E2-E4E7-E5B1-C3G8-F6F1-C4B8-C6
2360 DATA E2-E4E7-E5F1-C4G8-F6D2-D3F8-E7
2370 DATA E2-E4E7-E5B1-C3G8-F6F2-F4D7-D5
F2-E5F6-E4D2-D3E4-C3B2-C3F8-E7
2380 DATA E2-E4E7-E5F2-F4E5-F4G1-F3D7-D6
D2-D4G8-F6
2390 DATA C2-C4E7-E6G8-F6D7-D5G2-G3G8-F6
F1-G2D5-C4D1-A4B8-D7A4-C4F8-E7
2400 DATA E2-E4E7-E5G1-F3B8-C6C2-C3G8-F6
D2-D4F6-E4D4-D5C6-B8F1-D3E4-C5F3-E5
2410 DATA E2-E4E7-E5G1-F3B8-C6F1-B5A7-A6
B5-C6D7-C6B1-C3F7-F6D2-D4E5-D4D1-D4
2420 DATA E2-E4E7-E5G1-F3B8-C6F1-B5A7-A6

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```

B5-A4
2430 DATA G1-F3D7-D5G2-G3G8-F6F1-G2E7-E6
2432 DATA G1-F3D7-D5C2-C4E7-E6
2440 DATA B2-B4D7-D5C1-G2G8-F6E2-E3E7-E6
B4-B5C7-C6
2450 DATA E2-E4E7-E5D1-F3G8-F6
2460 DATA D2-D4D7-D5C2-C4E7-E6B1-C3G8-F6
C1-G5F8-E7E2-E3H7-H6G5-F4B7-B6G1-F3
2470 DATA E2-E4E7-E5F1-C4G8-F6: DATA E2-
E4E7-E5D1-F3G8-F6
2472 DATA E2-E4E7-E6D2-D4D7-D5E4-E5C7-C5
C2-C3B8-C6G1-F3
2474 DATA E2-E4C7-C6D2-D4D7-D5
2476 DATA E2-E4C7-C5B1-C3B8-C6F2-F4E7-E6
G1-F3
2478 DATA E2-E4D7-D5E4-D5D8-D5B1-C3D5-A5
D2-D4
2480 DATA E2-E4E7-E5D1-H5G8-F6
2482 DATA E2-E4E7-E7B1-C3G8-F6G2-G3D7-D5
E4-D5F6-D5F1-G2D5-C3B2-C3F8-D6
2484 DATA E2-E4G8-F6E4-E5F6-D5D2-D4D7-D6
2486 DATA E2-E4G2-G3D2-D4F1-G2B1-C3D7-D6
2490 DATA END
2500 CK = CK +1: D$ = LEFT$(MO$, 1):GOSUB
B 3260:X1= D:Y1= VAL(MID$(MO$, 2, 1))
2502 IF CC =1 THEN Y1= 9 - Y1
2510 D$ = MID$(MO$, 4, 1):GOSUB 3260:X2=
D:Y2= VAL(MID$(MO$, 5, 1))
2512 IF CC =1 THEN Y2= 9 - Y2
2530 T = T +1:IF T > 1 THEN T =0
2540 IF CK > 1 THEN CM$ = CM$ + MO$
2550 RETURN
2560 '
2570 ' * * * * KNIGHT * * * * *
2580 MP = PP -21:GOSUB 3290:MP = PP -19:
GOSUB 3290:MP = PP -12:GOSUB 3290
2590 MP = PP - 8:GOSUB 3290
2600 MP = PP +21:GOSUB 3290:MP = PP +19:
GOSUB 3290:MP = PP +12:GOSUB 3290
2610 MP = PP + 8:GOSUB 3290
2620 IF F =0 THEN RETURN
2630 GOSUB 1570:RETURN
2640 '
2650 ' * * * * BISHOP * * * * *
2660 MP = PP:FOR C =1 TO 8:MP = MP +11:G
OSUB 3290:NEXT:MP = PP
2670 FOR C =1 TO 8:MP = MP -11:GOSUB 329
0:NEXT:MP = PP
2680 FOR C =1 TO 8:MP = MP - 9:GOSUB 329
0:NEXT:MP = PP
2690 FOR C =1 TO 8:MP = MP + 9:GOSUB 329
0:NEXT:IF F =0 THEN RETURN
2700 GOSUB 1570:RETURN
2710 '
2720 ' * * * * ROOK * * * * *
2730 MP = PP:FOR C =1 TO 8:MP = MP +1:GO
SUB 3290:NEXT:MP = PP
2740 FOR C =1 TO 8:MP = MP -1:GOSUB 3290
:NEXT:MP = PP
2750 FOR C =1 TO 8:MP = MP -10:GOSUB 329
0:NEXT:MP = PP
2760 FOR C =1 TO 8:MP = MP +10:GOSUB 329
0:NEXT:IF F =0 THEN RETURN
2770 GOSUB 1570:RETURN
2780 '
2790 ' * * * * QUEEN * * * * *
2800 GOSUB 2650:GOSUB 2720:IF F =0 THEN
RETURN
2810 GOSUB 1570:RETURN
2820 '
2830 ' * * * * KING * * * * *
2840 MP = PP +1:GOSUB 3290:MP = PP -1:GO

```

Continued.


```

SUB 3290:MP = PP +10:GOSUB 3290
2850 MP = PP -10:GOSUB 3290
2860 MP = PP + 9:GOSUB 3290:MP = PP - 9:
GOSUB 3290:MP = PP -11:GOSUB 3290
2870 MP = PP +11:GOSUB 3290
2880 IF F =0 THEN RETURN
2890 GOSUB 1570:RETURN
2900 '
2910 ' * * * PAWN MOVES * * * * *
2920 J= INT(PP / 10):I= PP - J * 10:IF P
P =0 THEN RETURN
2940 IF B(J, I-1)= 46 THEN MP = PP-1:GOS
UB 3290
2950 IF B(J, I-2)=46 AND B(J,I-1)=46 AND
I=7 THEN MP=PP-2:GOSUB 3290
2960 IF B(J +1, I -1) <> 46 THEN MP = PP
+ 9:GOSUB 3290
2970 IF B(J -1, I -1) <> 46 THEN MP = PP
-11:GOSUB 3290
2980 GOSUB 1570:RETURN
3000 IF X2 <> X1 OR B(X2, Y2) > 46 THEN
3020
3005 IF Y2= Y1+1 THEN LV =1
3010 IF Y1=2 AND Y2= Y1+2 AND B(X1, Y1+1
)= 46 THEN LV =1
3020 IF X2= X1+1 AND Y2= Y1+1 AND B(X2,
Y2) < BP THEN LV =1
3030 IF X2= X1-1 AND Y2= Y1+1 AND B(X2,
Y2) < BP THEN LV =1
3040 RETURN
3060 '
3070 ' * * * * * PAWN EATER * * * * *
3080 J= INT(PP / 10):I= PP - J * 10:IF P
P =0 THEN RETURN
3090 IF B(J -1, I -1)=112 OR B(J +1, I -
1)=112 THEN LV = KV
3100 RETURN
3110 '
3120 ' * * * CASTLING ROUTINES * * * * *
*
3150 B(5, 1)= 46:B(8, 1)= 46:B(6, 1)=114
:B(7, 1)=107:RETURN
3160 B(5, 1)= 46:B(2, 1)= 46:B(1, 1)= 46
:B(3, 1)=107:B(4, 1)=114:RETURN
3170 F=0:IF B(6, 8)=46:AND B(7, 8)=46:AND B(
5, 8)=75:AND B(8, 8)=82 THEN 3190
3180 RETURN
3190 B(7, 8)= 75:B(6, 8)= 82:B(5, 8)= 46
:B(8, 8)= 46:F =1:RETURN
3200 '
3250 '
3260 ' * * * * * NUMERIC VALUE FROM ASCII
* * * * *
3270 D = ASC(D$) - 64:RETURN
3280 '
3290 ' * * * * * LEGAL MOVE * * * * *
3295 IF F =0 AND LV < 0 THEN RETURN
3300 IF PP =0 OR MP < 11 OR MP > 88 THEN
RETURN
3310 X5 = INT(MP / 10):Y5 = MP - X5 * 10
: E =B(X5, Y5):IF E<>46 THEN C=8
3315 IF F =2 THEN 3400
3320 IF X5 < 1 OR Y5 < 1 OR X5 > 8 OR Y5
> 8 THEN RETURN
3330 IF F =0 THEN 3360
3340 IF E > 46 AND E < WP THEN RETURN
3350 MC = MC +1:MV(MC)= MP:RETURN
3360 IF E >= 46 AND E < WP THEN RETURN
3375 IF E <> 112 THEN LV = KV
3380 RETURN
3400 IF X5 = X1 AND Y5 = Y1 THEN LV =1
3410 RETURN

```

```

3990 '
4000 ' * * * * * WHITE LEGAL MOVE * * * * *
*
4002 F =2:PP = X2 * 10 + Y2:LV =0: H =B(
X1, Y1)
4010 IF H =110 THEN GOSUB 2570
4020 IF H =107 THEN GOSUB 2830
4030 IF H =114 THEN GOSUB 2720
4040 IF H = 98 THEN GOSUB 2650
4050 IF H =113 THEN GOSUB 2790
4060 IF H =112 THEN GOSUB 3000
4100 F =0:RETURN
5000 ' * * * * * PLAY WHITE * * * * *
5005 IF CK > 1 THEN 1260
5010 CC =1: T =1
5020 MO$ = "E2-E4":GOSUB 2500
5030 NF =0:GOTO 1400
10000 ' * * * * * GRAPHIC-BOARD * * * * *
10010 CLS
10020 A2=30:B1=-5:FOR BT=0TO3:A1=A2+7:B1
=B1+7:GOSUB 10360A1=A2:B1=B1+7
10030 GOSUB 10350:NEXT
10040 GOSUB 10370
10045 IF CC =1 THEN 10060
10050 A1=46:B1=63:GOSUB 10380:A1=53:GOSU
B 10400:A1=60:GOSUB 10420:A1=67
10052 GOSUB 10440
10054 A1=74:GOSUB 10460:A1=81:GOSUB 1048
0:A1=88:GOSUB 10490
10056 A1= 95:GOSUB 10510:GOTO 10077
10060 A1=46:B1=63:GOSUB 10510:A1=53:GOSU
B 10490:A1=60:GOSUB 10480:A1=67
10062 GOSUB 10460
10064 A1=74:GOSUB 10440:A1=81:GOSUB 1042
0:A1=88:GOSUB 10400
10066 A1=95:GOSUB 10380
10077 IF CC =1 THEN 10090
10080 A1= 39:B1= 6:GOSUB 10630:B1=13:GOS
UB 10620:B1=20:GOSUB 10600:B1=27
10082 GOSUB 10580
10084 B1= 34:GOSUB 10570:B1= 41:GOSUB 10
550:B1= 48:GOSUB 10530
10086 B1= 55:GOSUB 10520:GOTO 10110
10090 A1= 39:B1= 6:GOSUB 10520:B1=13:GOS
UB 10530:B1=20:GOSUB 10550:B1=27
10092 GOSUB 10570
10094 B1= 34:GOSUB 10580:B1= 41:GOSUB 10
600:B1= 48:GOSUB 10620
10096 B1= 55:GOSUB 10630
10110 F=0:FOR X=1TO8:FOR Y=1 TO 8:V=B(X,
9-Y):IF CC=1 THEN V=B(9-X,9-Y)
10115 IF V = 46 THEN 10125
10120 IF CC =1 AND V < BP THEN V = V +32
:GOTO 10125
10122 IF CC =1 AND V > WP THEN V = V -32
10125 A1= 38 + X * 7:B1= Y * 7:F = F +1:
IF F > 1 THEN F =0
10130 IF V = 46 AND F =1 THEN GOSUB 1069
0:GOTO 10290
10140 IF V = 46 AND F =0 THEN GOSUB 1072
0:GOTO 10290
10150 IF V <> 46 AND V > 97 THEN GOSUB 1
0720:GOTO 10170
10160 IF V <> 46 AND V > 65 THEN GOSUB 1
0690
10170 IF V =114 THEN GOSUB 10830:PRESET(
A1+1,B1-4):PRESET(A1+3,B1-4)
10180 IF V = 82 THEN GOSUB 10810:PSET(A1
+1,B1-4):PSET(A1+3,B1-4)
10190 IF V =112 THEN GOSUB 10830
10200 IF V = 80 THEN GOSUB 10810
10210 IF V =110 THEN GOSUB 10830:PRESET(

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Continued.


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A1,B1-3):PRESET(A1+2,B1-4)
10220 IF V = 78 THEN GOSUB 10810:PSET(A1
,B1-3):PSET(A1+2,B1-4)
10230 IF V = 98 THEN GOSUB 10830:PRESET(
A1+2,B1-4)
10240 IF V = 66 THEN GOSUB 10810:PSET(A1
+2,B1-4)
10250 IF V = 81 THEN GOSUB 10810:LINE(A1
+1,B1)-(A1+3,B1):PSET(A1+2,B1-4)
10260 IF V = 113 THEN GOSUB 10830:LINE(A1
+1,B1)-(A1+3,B1),0:PRESET(A1+2,B1-4)
10270 IF V = 75 THEN GOSUB 10930
10280 IF V = 107 THEN GOSUB 10960
10290 IF H = 1 THEN RETURN
10295 NEXT:F = F + 1:IF F > 1 THEN F = 0
10300 NEXT:RETURN
10320 END
10330 LINE(A1,B1)-(A1+ 6,B1+ 6), 1,BF:RE
TURN
10340 LINE(A1,B1)-(A1+ 6,B1+ 6), 0,BF:RE
TURN
10350 FOR IT = 0 TO 3:A1= A1+14:GOSUB 103
30:NEXT:RETURN
10360 FOR IT = 0 TO 3:A1= A1+14:GOSUB 103
30:NEXT:RETURN
10370 LINE(A2 + 13, 1)-(A2 + 70, 58), 1,B
:RETURN
10380 LINE(A1,B1)-(A1,B1-3):LINE(A1+2,B1
)-(A1+2,B1-3):PSET(A1+1,B1-2)
10390 PSET(A1+1,B1-4):RETURN: 'A
10400 LINE(A1,B1)-(A1,B1-4):PSET(A1+1,B1
):PSET(A1+1,B1-2):PSET(A1+1,B1-4)
10410 PSET(A1+2,B1-1):PSET(A1+2,B1-3):RE
TURN: 'B
10420 LINE(A1,B1)-(A1,B1-4):LINE(A1,B1)-
(A1+2,B1)
10430 LINE(A1,B1-4)-(A1+2,B1-4):RETURN:
'C
10440 LINE(A1,B1)-(A1,B1-4):PSET(A1+1,B1
):PSET(A1+2,B1-2):PSET(A1+1,B1-4)
10450 PSET(A1+2,B1-1):PSET(A1+2,B1-3):RE
TURN: 'D
10460 LINE(A1,B1)-(A1,B1-4):LINE(A1,B1)-
(A1+2,B1):LINE(A1,B1-4)-(A1+2,B1-4)
10470 PSET(A1+1,B1-2):RETURN: 'E
10480 LINE(A1,B1)-(A1,B1-4):LINE(A1,B1-4
)-(A1+2,B1-4)
10485 PSET(A1+1,B1-2):RETURN: 'F
10490 LINE(A1,B1)-(A1,B1-4):LINE(A1,B1)-
(A1+2,B1):LINE(A1,B1-4)-(A1+2,B1-4)
10500 PSET(A1+2,B1-1):RETURN: 'G

```

```

10510 LINE(A1,B1)-(A1,B1-4):LINE(A1+2,B1
)-(A1+2,B1-4)
10515 PSET(A1+1,B1-2):RETURN: 'H
10520 LINE(A1+1,B1)-(A1+1,B1-4):RETURN:
'I&1
10530 FOR I=0 TO 4 STEP 2:LINE(A1,B1- I)
-(A1+2,B1- I):NEXT
10540 PSET(A1+2,B1-3):PSET(A1,B1-1):RETN
RN: '2
10550 FOR I=0 TO 4 STEP 2:LINE(A1,B1- I)
-(A1+2,B1- I):NEXT
10560 PSET(A1+2,B1-3):PSET(A1+2,B1-1):RE
TURN: '3
10570 LINE(A1,B1-2)-(A1,B1-3):LINE(A1+2,
B1-4)-(A1+2,B1)
10575 PSET(A1+1,B1-2):RETURN
10580 PSET(A1,B1-3):FOR I=0 TO 4 STEP 2:
LINE(A1,B1- I)-(A1+2,B1- I):NEXT
10590 PSET(A1+2,B1-1):RETURN
10600 PSET(A1,B1-3):PSET(A1,B1-1):FOR I=
0 TO 4 STEP 2
10605 LINE(A1,B1- I)-(A1+2,B1- I)
10610 NEXT:PSET(A1+2,B1-1):RETURN: '6
10620 LINE(A1+2,B1)-(A1+2,B1-4):LINE(A1,
B1-4)-(A1+2,B1-4):RETURN: '7
10630 LINE(A1,B1)-(A1+2,B1):LINE(A1,B1-4
)-(A1+2,B1-4)
10640 LINE(A1,B1-3)-(A1+2,B1-1):LINE(A1+
2,B1-3)-(A1,B1-1):RETURN: '8
10690 LINE(A1,B1)-(A1+4,B1-4), 0,BF:RETN
RN
10720 LINE(A1,B1)-(A1+4,B1-4), 1,BF:RETN
RN
10810 LINE(A1+1,B1-1)-(A1+3,B1-1):PSET(A
1+2,B1-2):PSET(A1+1,B1-3)
10820 PSET(A1+2,B1-3):PSET(A1+3,B1-3):RE
TURN
10830 LINE(A1+1,B1-1)-(A1+3,B1-1), 0:PRE
SET(A1+2,B1-2):PRESET(A1+1,B1-3)
10840 PRESET(A1+2,B1-3):PRESET(A1+3,B1-3
):RETURN
10930 LINE(A1+1,B1-1)-(A1+3,B1-1):PSET(A
1+2,B1-2):PSET(A1+1,B1-3)
10940 PSET(A1+3,B1-3):PSET(A1+2,B1-4):LI
NE(A1+1,B1)-(A1+3,B1)
10950 PRESET(A1+2,B1-1):RETURN
10960 LINE(A1+1,B1-1)-(A1+3,B1-1), 0:PRE
SET(A1+2,B1-2):PRESET(A1+1,B1-3)
10970 PRESET(A1+3,B1-3):PRESET(A1+2,B1-4
):LINE(A1+1,B1)-(A1+3,B1), 0
10980 PSET(A1+2,B1-1):RETURN

```

End of listing.

its move (MAKE MOVE). The computer will then redraw the board and ask for a new move from the player.

This is a very simple program. With respect to chess knowledge, it is the equivalent of the guy who makes his move by placing a finger (mentally, I hope) on the square he wants to move to and asks himself what is he getting and what the other player may get if he does move there. You can change or add to the openings library just by adding DATA statements to the list using the format of 23XXX DATA whiteblackwhiteblack-whiteblack. Your opening moves should fit in only one data statement.

The moves are entered using computer algebraic. That is, the board is represented by a two-dimensional coordinate system with the horizontal labeled with letters and the vertical with numbers. By convention, the horizontal is written first in such a way that each square in the board is represented by a unique letter-number combination. For example, the white king is in square E1 and the black queen is in square D8 at the beginning of the game. When the computer asks for your move, it is entered by specifying the coordinates of the square of the piece

to be moved separated with a dash (-) and the coordinates of the square you want to move to. For example E2-E4 tells the computer that you want to move the pawn in front of the king 2 spaces forward.

The only change from the above pattern of entering moves is for castling. For a short castling use O-O and for long castling O-O-O.

Feel free to change the value assigned to pieces and squares lines 1640 to 1970. Changing these values will change the way the computer responds. You may also wish to add a random value that will add more variety to the game. And if you can come up with better graphics (especially for the IBM version), please let us know. (The IBM version is on the Portable 100 BBS.)

Hope you have as much fun as I do with this program. Don't worry if you make mistakes. Just be patient and you will emerge a winner against this program in just a short time.

Jose Paz is a former electronic engineer, an amateur chess player, a ham operator (WP4RX) and a practicing pathologist in Puerto Rico.

COMPATIBILITY: All computers and their peripherals.

FCC, Personal Computers And The Law

Does your computer meet FCC standards? Here's how to tell.

by Marlene Jackson

The Federal Communications Commission has found Personal Computers to be the cause of interference to various Safety Radio Communications Services, including police, fire, emergency medical, aeronautical and telephone communication systems, as well as television reception and other electronic Home Entertainment equipment (HEEE).

In a continuing effort to decrease interference from personal computers, the FCC requires all computer manufacturers, vendors and distributors marketing or selling computing devices designed for home use (personal computers) to obtain a grant of equipment authorization and FCC ID number.

Selling or advertising for sale non-compliant computing devices is a violation of the FCC's rules and regulations and the Communications Act of 1934, as amended and may result in fines up to \$10,000 per day or imprisonment for up to one year.

If you purchase and re-sell computers, you must make sure that the units you purchase have valid FCC ID labels clearly visible on the outside of the computer case. Be aware that some FCC ID numbers have been found to be "phony" or "made up" while other FCC ID numbers are valid, but are for a different computer. Make sure that the FCC ID number is not only present and valid, but is the correct FCC ID number for the computer it is attached to! You can check to see if an FCC ID number is valid simply by calling the FCC PAL system.

PUBLIC ACCESS LINK (PAL)

The Public Access Link (PAL) is designed to allow access to information regarding pending and granted equipment authorization data for equipment

subject to certification, type acceptance, type approval, notification and other general information concerning the Commission's Equipment Authorization Program for radio frequency equipment.

The PAL system is available 24 hours a day, 7 days a week and can be accessed by modem at (301) 725-1072. PAL operates at either 300 or 1200 bauds, 8 bits, no parity and 1 stop bit (8N1).

IDENTIFYING AND RESOLVING COMPUTER INTERFERENCE

As personal computers continue to grow in popularity and processing power, more and more computers will be put into operation in the home, business and industrial environments. Interference from these computers will continue to increase and become a greater and greater problem in the future.

While the most common form of interference from personal computers occurs in townhouses or apartment complexes where the computer is situated close to a neighbor's TV or radio (perhaps on an adjoining wall between the apartments), there are occasions where personal computers have interfered with police, taxicab, aviation safety communications and other radio communications services.

You can easily determine if your computer is the cause of such interference by turning your computer off while observing the interference.

Interference from personal computers can take the form of a distortion of the picture, whining type tones, static noise and/or herringbone patterns through the TV picture. If your computer is the cause of interference, try one or more of the following measures:

- Re-orient the receiver antenna of your

TV or radio.

- Relocate the computer with respect to the receiver.
- Improve the shielding in the computer.
- Move the computer to a different outlet so that the computer and receiver are on different circuits.
- Attach a Low Pass filter to the power cord of the computer.
- If necessary, consult a dealer or TV technician for suggestions.

The FCC requires that all computers be tested and certified to comply with Part 15 of the FCC regulations before they are permitted to be sold or advertised for sale in the United States. FCC emission limits on computer devices are designed to provide protection against interference between users and prevent a personal computer from causing interference to other radio services.

You can check if your computer has been certified by the FCC by looking to see that your computer has a label with the FCC identification number.

REQUEST FOR RULES

You may obtain a copy of the FCC Rules and Regulations, Title 47 (CFR), Parts 0-19 from the Government Printing Office Bookstore. Forward request for regulations to: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 783-3238

REQUEST FOR APPLICATION AND FEE PROCESSING FORMS

Forward requests for computer application forms (Form 731) and the fee processing guide (Form 155) to: Federal Communications Commission, 1919 M St. NW., Washington, DC 20554, (202) 632-FORM.

COMPATIBILITY: MS-DOS computers.

Orbits: Voyage Through The Solar System

Does your computer meet FCC standards? Here's how to tell.

by Linda M. Tiernan

As Han Solo has been known to say, "I didn't do it. It wasn't my fault."

Orbits: Voyage Through The Solar System arrived in the *Portable 100* office, and looked good. It is produced by Software Marketing Corporation of Phoenix, AZ, and arrives on two 3.5-inch diskettes or four 5.25-inch diskettes. You need MS-DOS 2.0 or above, 512K RAM, EGA or VGA color graphics (Mouse is optional). We tried it on a portable Tandy machine and a desktop Tandy. Alas, it didn't work on the portable! Something was not right with the graphics. A call to Software Marketing Corporation produced the promise that it was only a minor bug, and fixable. As of this writing I don't have that fix in my hands. I can't prove that it works on a Tandy portable, just on a Tandy desktop. It isn't my fault. I'm going ahead with the review anyway. The program is worth looking at, and it's supposed to be portable-ready RSN, as they say in the business (Real Soon Now). So — with that caveat in mind — let's take a good look at a superlative program.

I have always been interested in astronomy, in the general sense. I want to learn more about the stars. I want to read fascinating facts about the asteroids, comets, and planets. I want to have some idea what astronauts and space scientists deal with. I want to discover some space reality, rather than science fiction. I want to learn the names of some of those celestial bodies out there. They are so much a part of our existence; we see them every day; and yet they're a great unknown to most of us.

I took an introductory astronomy course. To my great bewilderment — and, I'm afraid, to the bewilderment of a large portion of the class — none of the course seemed to be about the stars and planets. We talked about light waves,

elementary physics, geometry, and several different Somebody's Theory or Someone's Equation. I couldn't possibly have cared less.

Those who are really into astronomy will recognize the above as the description of a typical astronomy class. However, most of us taking that introductory astronomy course, non-scientists or with low-level science backgrounds, didn't know what hit us. I only wish that, 'way back then, someone had handed me a copy of *Orbits* to play with for a few hours. I would have been able to make the connections. *Orbits* is the sort of program I would like to see in one of the interactive displays at the Christa McAuliffe Planetarium. It would certainly communicate some of the concepts that are so very hard for us to grasp: Space is big. Objects and particles move in waves. Gravity affects everything in one way or another. We are small.

The beautiful *Orbits* opening screen has one choice only: BLAST-OFF! Choosing this screen gives you the Main Menu. Suddenly, you are standing in space, somewhere just beyond Saturn. All the planets are visible, beautiful — and they're MOVING. This is one of the greatest charms of *Orbits*, compared to any stale old astronomy book. Unless you choose to turn off the animation, you are never allowed to forget that everything "out there" MOVES. The planets move in *Orbits*'s Main Menu. The prominences, solar flares, and solar wind move. Comets' tails flash by. The asteroids waltz, Jupiter looms, Saturn tilts. For the first time, you begin to see why the understanding of physics is necessary.

The choices from the Main Menu are: Info, Sun, Earth, Moon, Planets, General, and Quit. The Planets button is pressed when you first reach the Main Menu, so you can see the Planets menu: Compari-

son, Mercury, Venus, Mars, Asteroids, Jupiter, Saturn, Uranus, Neptune, Pluto, Comets. The deceptively-simple menu choices cover a wealth of information. Each planet submenu in the Planets section has at least seven options besides a return to the stunning sub-menu title page: General, Structure, Compare Structure, Orbit, Compare Orbit, Solar Shuffle, To Main Menu. The General section gives basic information about the particular planet, plus interesting facts specific to that planet. Since planetary structures vary remarkably, the STRUCTURE section also varies with the planet. So does ORBIT. (I found the Pluto/Charon combination to be especially interesting here, since anything about Pluto's "Siamese-twin moon" was news to me.) However, the COMPARE sections are the same for all: they are across-the-board "file cards" allowing you to compare information on the planet you are studying at the moment with any of the other planets. "Comparison" is also available as a separate option on the Planets menu. And, of course, the sections on Asteroids and Comets come with entirely different choices. The Asteroids submenu includes Introduction, Orbits, Kirkwood Gaps, The Trojans, Properties, Solar Shuffle, and To Main Menu. Before you realize what is happening, you are being introduced to Somebody's Theories and Someone's Equation to explain interesting celestial phenomena. More amazingly, it's not painful. (I do have one comment to make. Someone who created this program likes cars. If it's not as long as so many automobile files laid end-to-end, then it's as thick as crankcase oil.)

Ditto with Comets. Like the other options, its menu is simple and painless. Before you are done, you will know more about comets than you ever thought you'd be able to understand.

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SOFTWARE REVIEW

Oh. Solar Shuffle. What's that, you say? Believe it or not, a picture puzzle. The computer takes the title page of whatever menu you're looking at, and scrambles it, creating 56 squares for you to reassemble. If you're successful — I'm told — it congratulates you, but let me clue you: It's a cinch to put the words in order, even to get them on the right part of the page, and also to put the planet back together; but on the stellar background of a planet, stars is stars. It's not very likely you'll be able to reassemble those unnamed starlit background areas well enough to ring the bell, unless you've got a photographic memory. I haven't done it yet, and I'm fairly good on puzzles. This is one of the only two interactive sections of this program.

Besides the Info and Planets menus, there are three other menus important to us: Sun, Earth, and Moon. You will learn what makes the Sun tick — how it started, what will happen to it, how its chemistry works. You will also achieve a clear grasp of the size and differences involved in the existence of a gas cloud, a sun, a nova, and a dwarf star. Graphics in motion, clear explanations, and logical segues into related fields make this foray into celestial knowledge pleasant and painless. Following the deceptively simple menus, you will end up studying the mechanics of tides, precession, the foci of ellipses, and all those other astronomical and physical mysteries that made me give up taking notes in my astronomy class and turn to sketching my teacher's face in the margin just to look like I was paying attention. What's more, you will understand the concepts — and if you don't, you can try again. Just go back and replay that section. The EARTH menu and submenus will make a geology teacher as happy as an astronomy teacher. By the time you work through it all, you've covered Size and Shape, Ecliptic, Tilt and Spin, Our View, North Stars, Seasons, Orbital Motion, and Track Motion. Likewise, you will learn about the moon's composition and orbits, and quite incidentally, learn a great deal about gravity and geometry.

It is a mistake to call the final section General. If anything, it is specific, a culmination of material learned in all the other sections, plus additional twists and innovations to further pique your interest and try your ability. It is the only part of the *Orbits* program, except the Solar Shuffle, that is interactive. It also attempts to teach you some of the higher concepts of astronomy — a nice combination. When the going gets tough, you have a chance to punch a few keys yourself.

From the General menu, you may choose Motions Of The Inner Planets or Motions Of The Outer Planets. Either of these show relative position and speed of planets as they orbit around the sun. You may speed them up or slow them down. There are no "orbit lines," just moving planets waltzing across the sky. The submenu choice Gravity will expose you to gravity theory, moons, and Einstein's Theory of Relativity. You will survive your exposure to it, and be able to see how your weight only calculates into two ounces on Pluto.

However, the star of this menu, and the one given the most space in the *Orbits* manual, is Orbital Mechanics. Here you may learn about Kepler's Laws (more laws, but digestible) and Transfer Orbits — but you will also get a shot at Orbit-Trek, the pride of *Orbits*. It is a "flight simulator." With what you have learned in the previous sections, you may now try to keep your space shuttle flying. I will admit that my feelings about Orbit-Trek are ambiguous. I have asked people who know about space flight or air flight about Orbit-Trek. They have tried it, and they think it's fun. I can't figure it out, even with the manual in front of me. Yet the rest of this software package appears to be geared just for someone like me. Perhaps it is because the thought of flying space shuttles just doesn't trip my trigger, but I can't figure out or remember all the control buttons and what they are supposed to do for your thrust, direction, speed, etc. (They are not labeled on the program you use, but only on other explanatory screens and in the manual), and all I do is crash. Yet the rest of the program appears to be geared for people just like

me. It's a disappointment, to work through all the rest of the *Orbits* program and feel that I've reached a higher level of understanding about astronomy, and then just sit here with this thing and crash — and crash — and crash. Obviously, you have to know much more than what I have learned by following the *Orbits* program. It is odd that such a sophisticated shuttle flight program should be on such an elementary astronomy program — or else, that such an elementary astronomy program should be attached to such a sophisticated space shuttle flight program. At any rate, I could do without it. Conversely, someone else might buy it just for the Orbit-Trek program, I suppose.

The manual for *Orbits* concentrates on how to load the program, what the opening screens should look like, and what your choices are. There are also a few screen illustrations to reassure you. It discusses using the keyboard versus using the mouse. It discusses "configuring Orbits" — really the last few choices on the General menu, which are Units Of Measure, Menu Animation, Mouse, and Select Printer Port. (I hope European crankcase oil is the same consistency as American crankcase oil.) Eight of the manual's thirty pages discuss Orbit-Trek — nearly a third, and I still didn't understand what I was starting with or where I was supposed to end up. There are good Troubleshooting instructions, and the manual tells you how to load *Orbits* without trying to teach you DOS from beginning to end. It also discusses printing. You can print the data for any planet or topic which you see on the screen, whenever a PRINT option appears. Naturally, you don't get the pretty pictures, certainly not in color. You get a rough-draft copy of the data which you see before you. That's as it should be, and typical of most gorgeous-graphic (in this case, VGA graphic) programs.

The space photographs which provide the foundation for this program come from NASA and the Jet Propulsion Laboratory. They were scanned by WinterTech for use in *Orbits*. Additional information and/or technical assistance was provided by the U.S. Naval Observatory, the U.S. Government Federal Information Center, Borland International, Inc., and Genus Microprogramming. Yet, this program is not a bunch neat pictures scanned together with quick bylines. Countless hours of tender loving care were put into *Orbits* by people who understand astronomy. I did notice a couple of typos (such as the "super-cold" Pluto's temperature range of -390 to +370 degrees F, hardly super-cold!), and I mentioned the "automobile" motif. Orbit-Trek the pet physics project of a WinterTech programmer.

The manual is plain paper, straight off a laser printer. Nonetheless, this is a quality program which, to my way of thinking, fills a very important gap in modern science: a plain-language introduction to astronomy as it really is. It won't matter if you are a beginner or you have truckloads of experience. The program is enjoyable to anyone who wants to learn more about our solar system. Even if you know this astronomical material already, you'll will enjoy watching the graphic expression of it. You can't help

learning more about the universe in which you live.

PRODUCT SPECIFICATIONS & SUPPLIERS

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COMPATIBILITY: Tandy 200.

PYRMID.BA

The classic solitaire game on your Tandy 200.

by Paul Globman

"All work and no play..." can make anyone feel pretty dull, so with this in mind, every so often I like to write something (program-wise) for entertainment purposes. Writing "game" software is every bit as challenging as writing "applications", and sometimes even more so. This month I would like to offer you *PYRMID.BA*, which can only be played on a Tandy 200 due to the 16 line LCD required for adequate viewing.

PYRMID is a solitaire game often played with a standard deck of cards. The first 28 cards are laid out as a pyramid (run the program and view the LCD) and the remaining 24 are held in the "pack". The cards available for play are the top card in the pack, the top card in the "waste" pile, and cards at the bottom of the pyramid.

The *LEFT* and *RIGHT* arrow keys allow you to move the "pointer" to the card you wish to play. The *UP* arrow "tags" the card above the pointer, the *DOWN* arrow advances thru the pack.

TAGGING

If you tag a King, it is removed. If you tag any other card, it will

display in reverse video. If you tag a tagged card, it will become untagged.

THE GOAL

The idea is to remove ALL 52 cards as follows: Tag Kings, and pairs of cards totalling 13 (Jacks are 11, Queens are 12, Aces are 1).

THE PACK

You can only go thru the pack 3 times. If two adjacent cards in the pack total 13, they may be removed (if you think those cards will not be needed to clear the pyramid).

NEW GAME

You may abort the current game at any time and begin a new game, or you may abort the current game and replay it, trying a different strategy. Use upper case for a (N)ew game or to (R)eplay current deck.



```
0 REM PYRMID.BA (c) 1990 by P.Globman
1 ES$=CHR$(27):RV$=ES$+"p":NV$=ES$+"q":D
IMC(52),D(30),P(24),PY(57):C$="A23456789
TJQK":P$=" "+STRING$(2,152)+" "
2 FORI=27TO31:B$=B$+CHR$(I):NEXT:B$=B$+"
NR":X=VAL(RIGHT$(TIME$,2)):X=RND(-VAL(MI
D$(TIME$,4,2))*60+X)
3 GOSUB27:FORI=1TO52:C(I)=I:NEXT:FORI=1T
O52:X=52*RND(1)+1:Y=C(I):C(I)=C(X):C(X)=
Y:NEXT
4 RESTORE:T=0:PM=0:K=1:X=49:FORI=1TO7:FO
RJ=1TOI:READY:PY(Y)=K:D(K)=X+J*4:K=K+1:N
EXTJ:X=X+78:NEXTI:D(29)=551
5 D(30)=555:FORI=1TO24:P(I)=C(28+I):NEXT
:GOSUB86
6 A$=INKEY$:IFA$=""THEN6
7 A=INSTR(1,B$,A$):IFA=0THEN6
8 ONAGOTO9,10,12,30,14,3,4
9 MENU
10 IFP<>19THENP=P+1:GOSUB91
11 GOTO6
12 IFP<>2THENP=P-1:GOSUB91
13 GOTO6
```

```
14 IFT<>0THEN6
15 IF(P2=PT)AND(PA=3)THEN6
16 IFP2=PTTHEN18
17 PP=PP+1:P1=P1-1:P2=P2+1:GOTO19
18 PP=1:PA=PA+1:P1=PT:P2=0
19 GOSUB20:GOTO6
20 IFP2<>PTTHEN23
21 PRINT@D(29)+1," ":IFP2=0THEN24
22 GOTO25
23 X=P(PP)MOD13:PRINT@D(29)+1,MID$(C$,X+
1,1);:PRINTCHR$(156+P(PP)MOD4):IFP2<>0TH
EN25
24 PRINT@D(30)+1," ":GOTO26
25 X=P(PP-1)MOD13:PRINT@D(30)+1,MID$(C$,
X+1,1);:PRINTCHR$(156+P(PP-1)MOD4)
26 GOSUB90:GOSUB92:RETURN
27 CLS:FORI=0TO4STEP2:LINE(0+I,0+I)-(239
-I,127-I),1,B:NEXT:PRINT@217,"PYRAMID":P
RINT@299,"by":PRINT@374,"Paul Globman
28 PRINT@451,"Copyright (c) 1990":LINE(1
22,10)-(52,102):LINE(122,10)-(192,102):L
INE(52,102)-(192,102)
```

Continued.

Pyramid.BA can be played only on the Tandy 200, due to the larger display size available on it as compared to the other Model T computers.


```

29 LINE(122,10)-(203,91):LINE(192,102)-(
203,91):RETURN
30 IF(P=18)OR(P=16)OR(P=15)THEN6
31 ONPGOSUB1,72,73,74,75,76,77,78,79,80,
81,82,83,84,1,1,85,1,85:IFP>15THEN42
32 READY:IFY=0THEN6
33 IFPY(Y)=0THEN32
34 IFPY(Y+7)<>PY(Y+8)THEN6
35 IFT=0THEN51
36 IFT=PY(Y)THEN55
37 IFPM=0THEN40
38 SM=C(PY(Y))MOD13+Y2:IFSM<>11THENBEEP:
GOTO6
39 GOSUB57:X=15-T:GOSUB58:T=0:PM=0:GOTO6
40 SM=C(T)MOD13+C(PY(Y))MOD13:IFSM<>11TH
ENBEEP:GOTO6
41 GOSUB57:Y=Y2:GOSUB57:T=0:GOTO6
42 IF(P=17)AND(P1=0)THEN6
43 IF(P=19)AND(P2=0)THEN6
44 IFT=0THEN53
45 IFT=15-PTHEN56
46 IFPM=0THEN49
47 IFY2+X<>11THENBEEP:GOTO6
48 X=17:GOSUB58:X=19:GOSUB58:T=0:PM=0:GO
TO6
49 IFC(T)MOD13+X<>11THENBEEP:GOTO6
50 Y=Y2:GOSUB57:X=P:GOSUB58:T=0:GOTO6
51 V=C(PY(Y)):Y2=Y:IFVMOD13=12THENGOSUB5
7:GOTO6
52 T=PY(Y):X=C(T)MOD13:PRINT@D(T)+1,RV$M
ID$(C$,X+1,1);:PRINTCHR$(156+C(T)MOD4)NV
$:GOTO6
53 IFX=12THENX=P:GOSUB58:GOTO6
54 T=15-P:Y2=X:PM=1:PRINT@D(D)+1,RV$MID$(
C$,X+1,1);:PRINTCHR$(156+VMOD4)NV$:GOTO
6
55 X=C(T)MOD13:PRINT@D(T)+1,MID$(C$,X+1,
1);:PRINTCHR$(156+C(T)MOD4);:T=0:GOTO6
56 T=0:PRINT@D(D)+1,MID$(C$,X+1,1);:PRIN
TCHR$(156+VMOD4):PM=0:GOTO6
57 X=6*(D(PY(Y))MOD40):Z=8*(D(PY(Y))\40)
-4:LINE(X,Z)-(X+23,Z+15),0,BF:PY(Y)=0:RE
TURN
58 FORI=(PP-(X-17)/2)TO23:P(I)=P(I+1):NE
XT:P(I)=0:PT=PT-1:IFX=17THENP1=P1-1
59 IFX=19THENP2=P2-1:PP=PP-1
60 GOTO20
61 S=0:FORI=1TO57:S=S+PY(I):NEXT:S=S+P1+
P2:Z=0:IFS=0THEN64
62 IFPA<>3THENRETURN
63 X$=" PLEASE TRY AGAIN!":GOTO65
64 X$=" CONGRATULATIONS!!":GOTO66
65 PRINT@200,"";:FORI=1TO10:PRINTSPACE$(
30):NEXT
66 LINE(50,72)-(90,72):LINE(70,52)-(20,1
02):LINE(20,102)-(120,102):LINE(120,102)
-(70,52)
67 LINE(69-Z+1,52-(Z-1)/3)-(50,72),0:LIN
E(69-Z,52-Z/3)-(50,72),1
68 LINE(69-Z+1,52-(Z-1)/3)-(89-2*((Z-1)/
4),70-1.3*(Z-1),0:LINE(69-Z,52-Z/3)-(89
-2*(Z/4),70-1.3*Z),1
69 LINE(89-2*((Z-1)/4),70-1.3*(Z-1))-(50
,71),0:LINE(89-2*(Z/4),70-1.3*Z)-(50,71)

```

```

:Z=Z+1:IFZ<>7THEN67
70 FORI=1TOLEN(X$):PRINT@334,RIGHT$(X$,I
):FORJ=1TO100:NEXT:NEXT:IFS=0THENPRINT@3
80," You won on";
71 RETURN
72 RESTORE94:RETURN
73 RESTORE95:RETURN
74 RESTORE96:RETURN
75 RESTORE97:RETURN
76 RESTORE98:RETURN
77 RESTORE99:RETURN
78 RESTORE100:RETURN
79 RESTORE101:RETURN
80 RESTORE102:RETURN
81 RESTORE103:RETURN
82 RESTORE104:RETURN
83 RESTORE105:RETURN
84 RESTORE106:RETURN
85 V=P(PP-(P-17)/2):X=VMOD13:D=29+(P-17)
/2:RETURN:END
86 CLS:P=17:FORI=1TO29:X=C(I)MOD13:PRINT
@D(I)+1,MID$(C$,X+1,1);:PRINTCHR$(156+C(
I)MOD4):GOSUB88:NEXT:PRINTES$"V";
87 GOSUB91:PRINT@D(29)-80,24:PRINT@D(30)
-80,0
88 X=(D(I)MOD40)*6:Y=8*(D(I)\40)-4:LINE(
X,Y)-(X+23,Y+15),1,B:PRINT@27,"Esc to Qu
it":PT=24:P1=24:PRINT@67,"R - Replay
89 PP=1:P2=0:PRINT@107,"N - New Game":PA
=1
90 PRINT@392,"Pass"PA;:RETURN
91 PRINT@596+P*2,P$:RETURN
92 PRINT@D(29)-80,ES$"K"P1:PRINT@D(30)-8
0,P2:IFP1=0THEN61
93 RETURN:DATA 1,8,9,15,16,17,22,23,24,2
5:DATA 29,30,31,32,33,36,37,38,39:DATA 4
0,41,43,44,45,46,47,48,49
94 DATA 43,0
95 DATA 36,0
96 DATA 44,29,0
97 DATA 37,22,0
98 DATA 45,30,15,0
99 DATA 38,23,8,0
100 DATA 46,31,16,1,0
101 DATA 39,24,9,0
102 DATA 47,32,17,0
103 DATA 40,25,0
104 DATA 48,33,0
105 DATA 41,0
106 DATA 49,0

```

End of listing.

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EXTRA! EXTRA!

Ancient Treasure Unearthed!

Pre-ROM software discovered! Read all about it!

by Mike Nugent

(TMN) Peterborough, NH, June 9, 1992—Late last month, while performing routine maintenance at the Model 100 National Archives in Novato, California, renowned non-scientist E.R. Faulkner unearthed what appears to be the remains of an early software package, one of the first of its kind in the world. News of the discovery was quickly relayed to appropriate DEFUSR authorities at *Portable 100* magazine, whereupon Nuge promptly swiped it for his column. The text of Faulkner's report follows:

May 23, 1992

Dear DEFUSR,

While going through a box of M100 related tapes from Radio Shack, I stumbled on one from PCSG. It has two .CO files, *RESTOR* and *FILEMN*, dated 1983. My problem is that I don't have the documentation to go with them. Does anyone know where I can find the booklet that came with these programs?

If Nuge still handles PCSG's business, maybe he's the one to answer this letter. If so, kindly put a list of PCSG's available software in my SASE. Thanks much.

E.R. Faulkner, Novato, CA

After weeks of painstaking analysis of the data contained in Faulkner's report, Mike "The Nuge" Nugent, a leading expert in the field of PreROMbian Software History, reported his findings. Speaking before a distinguished panel of oak, or maybe walnut, Mr. Nugent said, "I feel stupid doing this. Hey, where'd everybody go?"

He continued, "Mr. Faulkner's instincts were right on the mark. It's uncanny. Tri-Mike Network East does indeed have the old PCSG cassette tape-

based software products. Please tell him I've made a photocopy of the *RESTOR-FILEMN* docs, and his SASE—always good form, by the way—is on its way home."

He concluded by saying, "Look, I'm sorry. This is really nice paneling and all. Honest. But this is just too weird. I'm gonna go lie down for awhile."

Since that time, Mr. Nugent has remained unavailable for further comment.

**"I feel stupid
doing this.
Hey, where'd
everybody go?"**

REALITY CHECK

Okay, okay! I'm sorry! I know what you're thinking. You're thinking...

"Nuge did Part One of 'Dressing Up Your Documents' in February and Part Two in March. We were on a roll.

"But come April, where Part Three is supposed to be, there's some kind of 'Spring Break' column instead. Okay, fair enough. It was useful. I can live with that.

"So along comes May, and... nothin'! Nada! No column at all! Hmmm

"And now here it is, the June issue, and do you think we finally get Part Three? Nnnoooo! 'Course not!

"All right, Nuge, that's enough. What's goin' on? You startin' to lose it? Brain cells goin' south? I want some answers, and I want 'em now!

"Well?"

NUGE'S BIG ADVENTURE

Well, yes, you're right. Partly, anyway. It's not quite time to sing a rousing chorus of "The Ol' Gray Matter Ain't What It Used to Be," but I've indeed been a tad discombobulated.

I stepped back from publisher to editor after the December '91 issue, as running *P100* was diverting too much time from my own company, TMN East. That move helped, but not enough. So I downshifted again, to contributing editor, which in *P100* terms means simply, "columnist." It also means I'm no longer involved in the magazine's daily operation, and thus, seem to have achieved an optimum time balance.

The hitch was in the transition. Gathering, collating, sorting, and transferring four years' worth of my job paraphernalia—files, records, equipment, contact info, etc.—turned out to be more work than being publisher. All that, while simultaneously relocating all of TMN East to my home office! So I missed the May deadline, and you missed Part Three.

No problem. I knew you'd forgive me, considering the circumstances. What I didn't know was that I hadn't yet run out of circumstances.

No sooner had I settled into my new office, than a house we wanted to rent

became available. And off I went again! No transition to deal with this time. Nope. This time it's a whole family! Six of us and all our stuff. Oh, yeah ... and TMN East, too ... again. Sheesh!

But I'm finally settled in now, and almost not extremely sore anymore from lugging all that stuff. It's 9:09 AM, the sun's been up a while, the moon and I have been up all night, and Part Three's been up in the air for two months now. And it's gonna stay there.

NUGE'S BIG COP-OUT

Why? Because deadline is just a few hours away. And Part Three is more complicated than Parts One and Two. Especially for me, since it will involve lots of screen dumps of carefully selected screens, and many rewrites to ensure that the information's as clear, concise, and easy to understand as I can make it.

If I try to do all that in a hurry, I'll just be cheating both you and me. Better to wait until I can do a proper job. Next month should be about right. That is, of course, provided I've actually exhausted my ration of circumstances!

PROJECT-IONS

Assuming I really have met my

**These are just
perfect for someone.**

circumstance quota, I can now tackle some projects that have been on hold for more than a year. An important one is to put some long "lost" PCSG programs back into circulation. As Mr. Faulkner will see when he opens his SASE, PCSG produced several cassette tape-based programs:

- **RESTOR-FILEMN**: File management system and memory recovery program,
- **TENKY+**: Electronic calculator and financial analysis program,
- **TYPE+**: Electronic typewriter emulation program for text origination and formatting,
- **SORT+**: Rapid sorting program,
- **PUT+**: Data and information entry program,
- **DATA+**: Data entry, file maintenance, merge, and listings program,
- **TUTOR+**: Typing tutor program.

These are RAM-based programs,

produced before PCSG introduced ROM-based programs like *Write ROM*, *Lucid*, *Super ROM*, and *Disk+*. The ROMs incorporate much of what some of these programs do. For example, *Super ROM*'s database, *Lucid Data*, quite capably handles the data entry, sorting, merging, listing, etc., performed by *SORT+*, *PUT+*, and *DATA+*. *Write ROM* can do much of what *TYPE+* does, although each can perform certain functions better than the other. The *Lucid* spreadsheet can handle much of what *TENKY+* does.

But the RAM-based programs cost much less, making them accessible to someone with more limited funds. I'm sure these are just perfect for someone, so I aim to re-release them.

TUTOR+ is an excellent typing tutor, featuring a practice mode, test mode, even a game mode to add some fun, and comes with 30 lessons geared to teach touch typing on the standard QWERTY keyboard. It has adjustable speed, and it reports your typing speed, corrected for errors.

Because lessons are ordinary text (.DO) files, you can easily make your own customized lessons. For example, to learn typing on the Dvorak style keyboard, I just copied pages from the Dvorak typing manual into text files. Another idea is to use text files containing information on any subject you want to learn, for example, a foreign language such as French. That way you can practice typing and learn French at the same time!

Since **TUTOR+** has no ROM equivalent, it's high on my priority list for release.

FILEMN (part of **RESTOR-FILEMN**) provides six useful functions at the press of a function key. One commonly needed function, **CRLF**, automatically adds linefeeds to carriage returns for non-Tandy printers. **Invis** makes any **BASIC** (.BA) file invisible to the M100 menu. **Size** displays a file's size in bytes, and for text files, the number of words as well. **Kill** lets you easily kill a file. **Clr** clears all available memory, including the paste buffer, **BASIC** work buffer, and **HIMEM** pointer (useful after running .CO programs). **Name** lets you easily rename a file.

Write ROM performs all of these functions except **Invis** and **Clr**.

RESTOR (part of **RESTOR-FILEMN**) recovers text data lost as the result of a cold start or other mishap that causes a loss of memory. **RESTOR** must be loaded from tape after the crash. That makes it rather passe now, since a one-line **BASIC** program you can simply type

Continued on page 14.



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Screen Control Codes for the Model 100, Tandy 200 and NEC 8201

<ESC> +	CHAR\$(27) +CHRS(##)	MEANING/ FUNCTION
J	106	Clear Screen
l	108	Erase cursor's entire line
p	112	Reverse video
q	113	Normal video
A	65	Move cursor up 1 line
B	66	Move cursor down 1 line
C	67	Move cursor right 1 column
D	68	Move cursor left 1 column
E	29	Clear screen & HOME cursor
J	74	Erase from cursor to end of display
K	75	Erase from cursor to end of line
L	76	Insert from a line
M	77	Delete cursor's line
P	80	Display cursor
Q	81	Erase cursor
T	84	Display function keys
U	85	Erase function keys
V	86	Inhibit scrolling
W	87	Enable scrolling
Y	xy	Position the cursor at the location codes computed for X and Y

The first column is what you type from the keyboard of your Model T (the ESCape key plus...). The second column is the character code you put in a program to do the same thing (CHRS(27)+CHRS(...)).

PROMPTOR SERVICE

If you're plagued by computer bugs,
I know what it could mean
You have to patch the tiny
holes in your computer screen.

If my memory is correct,
In a program I once saw
you can command some bugs to leave
and boot some out the door.

You really can't be soft ware
these bugs are the main concern
If they have random access
You have to remain stern.

Don't ever curs or shout
It impels the bugs to byte
Just get down to basics
You must protect your write!

While you load your weapon,
display compatibility
show them the error of their ways
While sealing off their entry

When you've got them all locked in
The program should go well,
Just drive them all together
And delete them all to hell.

Barbara Kane, Elkhart, IN

DEFUSR appears monthly to answer your questions about Tandy notebook computers.

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P.O. Box 428, Peterborough, NH 03458-0428.
Please enclose a stamped, self-addressed envelope for our reply.

FOOTNOTING WITH WRITEROM?

I have been using *Write ROM* as my word processor for several years on a Tandy 102, but really miss the total lack of special provisions for footnoting, especially the provision found in all top-level word processing programs (such as *Word Perfect* and *Microsoft Word*) for automatic renumbering of footnotes when a new note is introduced in a long chain of already-existing note numbers?

Do you know of any word processing program for the Tandy 102 with such a provision? Is there a "professional" word processor for the Tandy that has been designed with the academic community in mind?

A related problem I have is the 29K memory limitation. Using *Write ROM* with Travelling Software's *Boosterpak* I get the convenience of a RAMdisk, but I still get the "out of memory" sign every 10-12 pages of text — extremely unhandy when it comes to printing very long documents seamlessly. Then I have to put the file onto disk, kill it in RAM and open up a new file in order to continue with the same long document. Do you know of anything on the market which would enable me to use the facilities of *Write ROM* without being so hindered every 10-12 pages?

I know you have reviewed *Write ROM* in previous years, but it would be helpful to new subscribers if you would either re-publish or update the word processing situation for the Tandy. A comparative test *a la* Consumer Reports would be very helpful, and I would even advocate a permanent rubric in your magazine devoted to the ins and outs of word processing using third-party "sophisticated" programs such as *Write ROM* and *T-Word*, and aimed for students and teachers — as well as the business community and general users who find *TEXT* too limited.

Paul Gabriner
Amsterdam, Holland

I talked with Nuge about your problems with *Write ROM*. While *Thought Outliner* in *Super ROM* does number paragraphs and could be used as a storage/maintenance vehicle for footnotes, *Write ROM* was not designed to provide footnoting in your documents. You have footers, of course, but that's not the same thing.

Next, while you can chain files while printing with the .in command, you cannot create one file that is bigger than 29K. *Write ROM* was written before large RAM storage became available and, as a result, makes no provisions for creating and maintaining a larger than memory file.

I still get "out of memory"...

We just finished a series of reviews on *Super ROM* and the *Ultimate ROM II*, starting in the November 1991 issue and ending with the February 1992 issue.

-tk

MUSIC NOTATION FOR THE MODEL 100

Is there now or has there ever been a program for the Model 100 with which you can print music (staff and notes) to paper? I use both Radio Shack DMP105 and Tandy DWP230 printers, but I would think the DMP105 would be the more feasible option. If there is no such program available, it could possibly be a challenge to any of you programmers to come up with one. I know I would appreciate such an offering, and I'm sure there are others.

I enjoyed "Hints for New Laptoppers:

Ten Commandments" by Sean G. Dwyer (Dec. 1991). However, under section (8) ONLY A PIONEER SHOULD BE FIRST WITH THE LATEST, he missed one HUGE source of assistance to every Model 100/102/200 user, and that is Richard Hanson and his group at CLUB 100. He has given me so much invaluable help, and he is willing to help even the most uninformed on the use of their laptop. He will help you become accustomed to the use of the CLUB 100 BBS, and unlike some of the other services, this one is FREE. Of course, you have to reckon with Ma Bell and AT&T, but use of the CLUB 100 BBS carries no charge by CLUB 100. I know you carry their advertisement in the magazine, but it doesn't quite convey how willing they are to help, and the friendliness of every one there.

Diane L. Gelet
Ruffsedale, PA

Sorry, but I'm not aware of any program that prints notation to paper. Do any of our readers have a source for this?

tk

POWER SOURCE

Where I can buy a portable power source for my NEC PC-8201A?

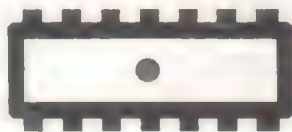
For a few years I used a battery purchased from *Prairie Power*. I thought this battery was just about perfect, because it was rechargeable and would last over one hundred hours between charges. But it has given up the ghost and I have not been able to contact the same source for a replacement.

I don't need to go one hundred hours between charges, but I would like to get more than that offered by the Ni-Cds — say, at least twenty to forty hours.

My wife will be most grateful if you can come up with an answer since she uses my PC-8201A for her genealogy research away from home.

Robert Williams
Warren OH

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You could try what I used to do with my Model 100, use a NiCd lantern battery. This unit is about the same size as the old Prairie Power battery. It is hard to find, but is available. You can even use the same power clips and charge from the Prairie Power battery on the lantern battery.

If you have trouble locating a NiCd battery, you can just use the standard lantern battery available at any sports shop or full-line department store. I found that I got about three or four weeks of use from one before I needed another, and the price was about the same as four AA alkaline batteries — but with a longer life. There are alkaline lantern batteries that last even longer, but I didn't find them cost effective (they were almost double the price of the standard battery and didn't deliver twice the life), but that was several years ago and things may have changed since then.

Chipmunks and Super ROM

My problem involves my Chipmunk and happens more often than not. After I install Super ROM and use my DMP 105 to print my file, my Chipmunk does not respond when I push "reset". It's only after I do a forced cold start that the drive engages and appears on the menu. This leads me to conclude that the use of the ROM and the printer leaves something in high memory that needs to be eliminated

so the Chipmunk will load its program. I've also eliminated Super ROM from the menu with CALL 63102,0,1.

I tried things like CLEAR0, MAXRAM but without any results. I still have to do a cold start. Is there anything I can do other than a cold start which kills the files I want to save?

Please thank Nuge for his series on Write ROM. He has filled in the gaps left by PCSG's otherwise fine manual.

E.R. Faulkner
Novato, CA

You've got us stumped. Yours is the first complaint we've received about this problem. As far as Nuge knows, Super ROM is not doing anything in high memory that would cause the problem you mention. Has anyone else encountered this problem? And does anyone have a solution?

CHDUMP FOR TTXPRESS

I have been using CHDUMP.BA, but with only partial success. I have a TTXpress portable printer and have been unable to modify your code sufficiently to print a recognizable graphic from the screen of my M-100 to the TTXpress.

CHDUMP evidently prints each pixel to the printer three times contiguously. Unfortunately this uses up $40 \times 6 \times 3 = 720$ pixels, while the TTXpress apparently prints a max of 520. Thus, the graphic is

DEFUSR

somewhat distorted (the width is expanded relative to the height) and the right hand portion of the graphic is lost and does not print.

The aspect ratio would be about right and the full graphic would print if a pixel were printed twice, not thrice ($40 \times 6 \times 2 = 480$), but I cannot determine what program changes are needed.

If you can help me out, it would be much appreciated.

William Lowerre
Chevy Chase, MD

You are right, the program is printing each pixel three times. The cure is to look for three identical numbers in the CHDUMP.BA data statements. The numbers are 231 decimal in line 750. Change one of these to 127. Do not just delete the 231. There are three spaces reserved for these commands and three spaces must be filled. The 127 will fill the space while telling the program to do nothing.

-tk

CHIPMUNK & 102

I've got a different answer for W.R. Dill, the guy who asked if a 102 could be used with a Chipmunk in the September P100 DEFUSR column.

According to Holmes Engineering (when I asked them about 3 years ago or so) the Chipmunk can be used with a 102 if you make a special modification. Apparently, when they redesigned the M100 to make the T102, Tandy disabled the RESET output through the system bus, thus eliminating the computer's ability to send the command that turns the Chippy on. So, if you can figure out how to make this hardware change and how to hook up the the T102's system bus to Chipmunk header board, then you can make the two work together. Of course, if anyone could figure out what happened to Holmes, that would make the whole project a lot easier.

Peter Ross
CompuServe 72027,3653

What Tandy did was add one-way buffer chips to the bus connector on the back of the 102. They did this because people, who were not experts at electronics, were experimenting with adding devices to the bus on the Model 100. Unfortunately, they ended up overloading the chips in the computer and literally burning them up. They would then return the Model 100 to Tandy as defective.

To protect the chips inside the Model 102, therefore, Tandy added buffer chips. One-way buffer chips are cheaper than two-way, so those were the ones they used.

The cure is to remove, or jump, the buffer chips. Not a task for the faint-hearted or electronic novice.

-tk



The New 4800 HD notebook computer, now available from Radio Shack.

Tandy Introduces Two 80486 Notebook Computers

Two new Tandy notebook computers made their debut at the Consumer Electronics Show in Chicago. Both models — the Tandy 4800 HD and Tandy 4860 HD have the power and features expected in a desktop computer, including a built-in hard drive, floppy disk drive

and four megabytes of memory.

The two systems differ only in their Intel 80486 microprocessors. The Tandy 4800 HD is a 20MHz 80486SX-based notebook PC, while the 4860 HD is a 33MHz notebook based on the 80486DX chip.

Among the standard features in-



Tandy's new 4860 HD portable notebook computer.

cluded with both notebooks are:

Four megabytes (MB) of standard memory, expandable to 20MB; eight kilobytes of cache memory — sufficient memory to run Windows-based applications and most business, education or entertainment software.

One 3.5 inch 1.44MB floppy drive.

A 19-millisecond, internal 60MB hard disk drive.

Full size keyboard with embedded numeric keypad.

Support for optional internal trackball pointing device.

VGA graphics, 640 x 480, 64 gray scales.

10-inch diagonal edgelit LCD display with a non-glare surface and a one-to-one aspect ratio

Support for simultaneous use of the internal LCD and an external VGA monitor.

Rechargeable NiCd battery which supplies continuous power for up to three hours.

110/220-volt AC adapter/charger for international travel.

Built-in power management features controlled by users to maximize battery life. For example, if the display is closed without turning the computer off, the system will automatically go into Suspend Mode and a warning beep will alert the user that power has been left on.

External VGA monitor port.

External 101-key keyboard port.

One serial port.

Internal modem slot for optional 2400 bps/Send and Receive Fax Modem.

MS-DOS 5.0 operating system, Microsoft Windows 3.1, Microsoft QBasic, Microsoft Shell, and America Online software included.

One year limited warranty.

Other optional accessories include an auto power adapter, 4 MB memory upgrade, spare battery, fabric carrying case and leather carrying case.

The Tandy 4800 HD carries a list prices of \$2,999. The Tandy 4860 HD retails for \$3,499. Both notebook computers are available at Radio Shack stores and dealers nationwide.

For more information, please contact: Tandy Corporation, 700 One Tandy Center, Fort Worth, TX 76102. (817) 390-3487. Or circle 61 on reader service card.

Wine Online

In the past, discovering California's hidden treasure of small wineries took a great deal of research, many reference books, lots of notes — and lots of phone calls. Now it's just a PC and modem away. *Wine OnLine* has detailed information on two hundred and sixty-two small to medium sized California wineries like Garric-Langbehn, Fellom Ranch, McHenry, Pepperwood Springs and Sunrise.

Wine OnLine includes:

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What's Cooking - a collection of recipes from California restaurants and wineries.

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Oh Good, Another Expert! - special advice and straightforward answers to your questions about wine.

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Anyone who enjoys wine will find *Wine OnLine* a comprehensive source of information and a very convenient means of ordering distinctive wines.

Set your communications software to 8 databits, 1 stopbit and no parity (V100 terminal). Dial 800-972-3680 and you will be put directly into *Wine OnLine*. Cost is 0.30 per minute with a \$5.00 monthly minimum. All use charges will be credited toward purchases.

In addition to the database, *Wine OnLine* publishes a no-cost quarterly newsletter.

For more information, please contact: Hartford Associates/*Wine OnLine*, P.O. Box 97, San Geronimo, CA 94963. (800) 892-8802, fax (415) 488-9551. Or circle 62 on reader service card.

Business INFOLINE

How can you 'grow' your business without spending all your time researching leads? Try Business INFOLINE. It's a kind of nationwide business "directory assistance", but provides more complete information than the phone company.

For example, you can:

Ask for types of businesses: such as the names and phone numbers of "Florists" in Peoria, or the address of the "BMW dealer" in Marina del Rey.

Get addresses and ZIP codes (which the phone company won't provide).

Locate a company when all you have is a name: get full address, name of the owner, number of employees, sales volume, products

sold, and more.

Business INFOLINE operators access a database containing every listing from over 4,800 Yellow Page directories nationwide — over 9 million total listings. Use the Business INFOLINE for qualifying prospects, generating sales leads, making credit decisions, or as a national reference source about every business in the United States.

If you'd like to try the Business INFOLINE, call (800)638-7171 or (900)896-0000 (charged to Visa, Mastercard or American Express).

For more information, contact Business INFOLINE, 5711 South 86th Circle, P.O. Box 27347, Omaha, NE 68127. (402)593-4593. Or circle 63 on reader service card.

BLAST Remote Control for Procomm Plus gives Procomm Users Remote Control Capability

U.S. Robotics has released its newest software product, **BLAST** Remote Control for *Procomm Plus*. It adds remote control capability to *Procomm Plus*, using the same menu interface and gives users the ability to remotely control another PC.

Remote control allows remote access to files and applications on another computer, giving users the ability to actually run programs on another PC as if they were actually sitting at the remote keyboard.

BLAST Remote Control for *Procomm Plus* adds transparent PC-to-PC remote control functionality to *Procomm Plus*. The product includes easy-to-install software for the control PC that adds itself to

Procomm's dialing directory by automatically editing the *Procomm* dialing directory database file. It also includes the software module for the host PC that allows callers to perform remote control. Important features of **BLAST** Remote Control for *Procomm Plus* include: dial-back security; remote mouse support; color graphics capability; and video scaling, to increase the speed of graphics transmission.

BLAST Remote Control for *Procomm Plus* has a list price of \$69. For more information, contact U.S. Robotics, 8100 North McCormick Blvd., Skokie, IL 60076. 800-DIAL-USR. Or circle 64 on reader service card.

Leave Your Spare Batteries At Home With Laptop Lightning

Tired of lugging around those spare batteries for your portable PC? Now you can leave 'em at home. With *Laptop Lightning* at work, your portable PC's batteries can last up to twice as long.

When you ask your computer to "read" data, the computer must go get it — either from the hard drive, or from a floppy. Likewise, when you tell your computer to "write" data, the computer must carry that data to

the designated hard drive or floppy, find a place to put it, and store it in the proper location on the disk.

When done this way, "reading" and "writing" involve mechanical actions. The computer must use battery power to spin the hard drive or floppy, and still more power to properly position the read/write heads. *Laptop Lightning* eliminates most of that power-draining mechanical action, by putting the data you use

most in your computer's RAM. It also makes writing data to disk more effective, by grouping lots of small writes into fewer large writes.

Just load *Laptop Lightning* once, and forget about it. It runs invisibly in the background on any IBM-compatible DOS-based computer. A built-in menu lets you specify which disks are cached and the size of the cache. You can even control read requests and write-delay times.



Laptop users can stop fumbling when typing documents, with the Laptop Easel Clip from MicroComputer Accessories.

Portable Easel for Laptop Users

Tired of propping your documents against your briefcase? For laptop computer users on-the-go, MicroComputer Accessories has a copy holder specifically for their use. The Laptop Easel Clip (Model #6260) is adjustable and folds flat for easy storage. Retail price is a

modest \$9.95.

Contact Pam Schultz, MicroComputer Accessories, 5405 Jandy Place, P.O. Box 66911, Los Angeles, CA 90066-0911. (310)301-9400, x 201. Or circle 65 on reader service card.

Power Disk now included with PC-Kwik

Multisoft Corporation is now including *Power Disk* in specially marked packages of its utility package *PC-Kwik PowerPak*.

PowerDisk enables you to view, test and defragment disk drives for faster drive access.

Special batch processing modes and other options are available to allow automatic use based upon different reorganization strategies and protection levels. Specifically designed to handle a wide range of media including very large media up to 1 Gb in size, *PowerDisk* includes safety features to insure the user against data loss.

"Reorganizing disks is an important element in optimizing the per-

formance of a PC," says Bruce Shafer, Multisoft president.

Suggested list price for *Power Disk* is \$79.95. *Power Pak* retails for \$129.95. For a limited time, customers who purchase the bundled package are eligible for a \$10 rebate. Customers who purchased *Power Pak* after April 15, 1992 can contact Multisoft Corporation to receive a copy of *Power Disk* at reduced price.

Contact: Lee Kufchak, Multisoft Corporation, 15100 S.W. Koli Parkway, Suite L, Beaverton, OR 97006. (503) 644-5644, fax (503)646-8267. Or circle 68 on reader service card.

Laptop Lightning requires only 17K of RAM. Suggested retail price is \$39.95.

To order call toll-free 1-800-967-5550. MC/Visa/AmEx and company purchase orders accepted.

For more information, contact Lucid Corporation, 101 W. Renner Road, Dallas, TX 75082-2017. Tel (214)994-8100. Fax (214)994-8103. Or circle 67 on reader service card.

COMPATIBILITY: MS-DOS computers.

Creating Forms With *Filer* And *Form Setup*

DeskMate's Filer isn't a Cadillac, but it isn't a Yugo either.

by Linda M. Tiernan

It looked like a simple request. My employer needed to create, from scratch, a brand-new mailing list. This list had to print "one-up" adhesive labels, including a line for the country. It would be nice, my employer told me, if a message could be printed at the top, but it wasn't necessary. I had to be able to assign multiple codes to these individual names and addresses, sort them by alpha or ZIP order, and print selected labels. We had to generate reports on the numbers and types of labels printed when we were done. Also, we had mighty little money to spend (so who does?).

I didn't realize that I was facing a serious problem. I have been using various Tandy computers since 1980. Even the old TRS-80 Model 2's had mailing programs available that could fulfill my employer's requirements. One of my favorites was the *Galactic MailFile*. I didn't know that since the heyday of the Model 2's, we've come a long way—backwards. No such program now exists for the modern Tandys.

The *Address* program built into *DeskMate* can print all kinds of labels. It works well with my printer. It is fuss-free to manipulate. Unfortunately, it has one fatal flaw. Each code entered on *Address* creates a new list by which to sort and select items. Each is a new derivative of the master list, and *Address* can create a maximum of twenty-five of these sublists before it refuses to add more. We had fifty-three codes.

The store-bought packages that I saw in my tours around a good portion of northern New England generally created great graphics on the labels. I didn't need great graphics. What I needed was a label program that could generate reports, accept any combination of codes, and retrieve and print labels by those

codes. My informal survey found that the few programs that could create multiple codes generally could not report. Most could not create multiple codes at all. You could have one label in any variety of pretty graphics. (This is another one of my beefs, worth a column all by itself: the Yes, It's A Crummy Program, But It's Got Great Graphics! school of programming thought.) My search included shareware packages as well as commercial ones, without hooking a likely candidate for what I thought would be a simple job.

"No problem," said my boss (a sometime member of the YIACPBIGGG!

My search included shareware packages as well as commercial ones.

gang). "I've got just the program you need." A couple of days later, he slapped it on my desk. It was a database program.

"All you have to do is learn how to use this," he said, "and you can create any

Figure 1. I used *Form Setup* to create this template for individual records.

Figure 2. I entered this information, using *Filer*, on the form I had created with *Form Setup*.

kind of a mailing list program you need."

"Terry," I said (Why be coy? It was Terry, of course), "if I had the ability to create new database programs from scratch, I sure wouldn't be working HERE."

Snubbed, he responded, "Well, you've got *Filer* on *DeskMate*. Can't it do something?"

Well, could it? I sat down to think about it.

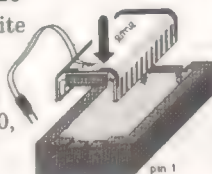
DeskMate's Filer program is a two-part operation. First, you use *Form Setup* to create the blank version of the form. Then, you use *Filer*, with the form you created as a master, to enter data. It should be able to create a blank master-form that looks like a mailing label, with spots marked for Name, Address, City, State, ZIP, Country, and so on. The *Form Setup* program could also allow you to "print a report" (i.e., the label) on seven lines with a maximum width of 34 columns (all those years with *Galactic MailFile* did teach me a few things).



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DESKMATE

I consulted the two most worthwhile methods of learning about anything regarding *DeskMate: Getting the Most Out of DeskMate 3*, by Michael Banks, and the *Teach Me* tutorial included with the *DeskMate* program. [Ed. note: All that grief about the database program and not one word of thanks for getting her the *DeskMate* book.] *Teach Me* comes with sample files allowing you to set up a home

inventory. It gives the user a very basic idea of what a working *Filer* program can do. Michael Banks's book goes further. He writes about the concepts behind database programs as well as the bells and whistles you can put on reports once you have mastered *Filer* basics.

The result of my study on what I already had, without spending another cent, was that it could be done—with a strain. Probably, as I keep practicing, I'll do better. Through *Form Setup*, I could create Name through ZIP and Country lines. I could even have pictures on the screen, if I wanted to. I could create a Report that would be a complete mailing label. I could have a line for a Code,

Figure 3. *I used Form Setup to create this template for Reports (mailing-label sized, with summary).*

also insisted that these were now separate and distinct (Code01=017 was not the same as Code02=017). It would not allow a "Y/N" or checkmark system with all codes listed (just type Y or X beside the ones which applied), because *Form Setup* struck its limit somewhere in the forty-odds. It would not take fifty-three Codes!

What *Filer* did easier than any other program, however, was Copy information from one screen to the next. So, what would have been a serious stumbling block on any other program became only a minor inconvenience. I typed in John Smith's information, typed in the first code on the Code line, saved it, changed the code to the next one, saved it, and changed it again, until I had saved a label under every code that John Smith required.

I used the Define Report function of *Form Setup* to create my label format. *Form Setup* contains a four-part template (Header, Body, Summary, Footer) which can be resized to fit. To make labels, I needed no Header or Footer. My theoretical "report pages" needed neither a title at the top nor page numbers at the bottom. I Resized the Body to make it seven lines long (stopping at the top of the next label), and fixed the Summary so that it gave me a total number of items printed. Result: My labels were printed by however I sorted and selected them in *Filer*, and the last label said: "Total Items Printed:" and how many. It was not ideal—I couldn't print a different kind of summary report on paper afterward, for each set of *Filer* data can have only one Report format attached to it, and that's what I had set up to print the labels—but it sure beat counting them by hand. (Another note: If you put a picture on your *Filer* screen, it will not be printed with each record, either—just the data.)

Filer can Find, Sort, or Count, but it's an elaborate system. You must choose a field (Name, Code, etc.); then tab to a set of push-buttons labeled "Equals/Greater Than/Less Than," etc. and select one (for an exact match, or a larger or smaller near-miss); then

It could be done— with a strain.

and pick any number of unlimited codes to sort by and select.

It meant some re-thinking on my part. I was accustomed to programs where I put in the Name, Address, etc., and when I got to Code, I typed in several different ones. The program then selected the code I wanted from the several codes typed in that line. *Filer* took one and one only. I could not put in "John Smith/ 123 Main Street/ Anytown/ NY/ 13621/ U.S.A." and then type in a series of numbers on the Code line (005 017 035 070). When I chose one code later (such as 017), John Smith would not appear, because that was not what the Code line said (It said 005 017 035 070). *Filer* saw the line as a single unit. If I used *Form Setup* to create multiple Code lines, the program balked. It insisted on different names for the different code lines (Code01, Code02, Code03). It

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Further, LUCID[®] has what no other spreadsheet has: Cut, Copy, and Paste. It uses the same keys as Cut and Paste in TEXT, but here's the difference: it takes all the formulas with it when you paste and they all automatically recalculate with the entire sheet.

And here is what is really amazing. You can copy or cut from one spreadsheet and paste into another spreadsheet or even a TEXT file.

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You can prepare a report section in your spreadsheet with instructions to your user for printout, and they can produce a personalized printout that responds to their input. All your formulas and tables that did the calculations and provided the facts are invisible to that user. LUCID[®] is useful for doctors for patient questionnaires, troubleshooting technicians, purchase clerks, people doing job quotes, stores for customer workups, insurance agents and anybody who needs to process specific facts and numbers to produce a report based on those responses.

LUCID[®] comes with a manual that explains not only the characteristics of LUCID[®] but will train you how to use a spreadsheet even if you have never seen one before. You are shown how to do budgets, forecasts, breakeven analysis amortizations and many other types of personal and business reports and calculations.

User friendly is such an over-used term in this industry, but a typical comment has been "I have never seen a spreadsheet that does so much, and yet LUCID[®] is so much

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if you don't agree."**

WRITE ROM is the definitive word processing extension for the Model 100. PCSG produced the first text formatter for the Model 100, now sold by Radio Shack as Scripsit 100. Now, 18 months later, PCSG introduced WRITE ROM. Those who have experienced it say WRITE ROM literally doubles the power of the Model 100.

WRITE ROM — as its name implies — is on a snap-in ROM. You simply open the little compartment on the back of the Model 100 with a quarter and press WRITE ROM in. It's as easy as an Atari game cartridge. You can use other ROM programs like Lucid whenever you wish.

WRITE ROM lets you do every formatting function you'd expect, like setting margins, centering, right justifying and creating headers and footers. But it does them under function key control.

WRITE ROM remembers your favorite format settings so you can print a document without any setup, but you can change any formatting or printing parameter instantly with a function key.

WRITE ROM's "pixel mapping" feature shows you an instant picture on the screen of how your printout will look on paper.

In all there are 64 separate features and functions you can do with WRITE ROM, and some of these features are truly breakthroughs for the Model 100.

First, WRITE ROM lets you do search and replace. Any word or phrase in a document can be searched for and replaced with any other phrase where the search words appear.

Second, WRITE ROM lets you send any text (formatted or not) to any other computer over the phone with just a function key. What's more, it dials and handles sign-on and sign-off protocol automatically.

Third, WRITE ROM has a wonderful feature called Library that lets you record favorite phrases, words or commonly used expressions (often called boilerplate).

Any place you wish Library text to appear you just type a code. WRITE ROM automatically inserts the text just like a Xerox Memory Writer. Picture what you can do with that kind of capability.

WRITE ROM is blindingly fast. No one can claim faster operation. Because it is on ROM it uses virtually none of your precious RAM. It works with any printer, serial or parallel. You can make a duplicate copy of a document file under a new filename. Rename or delete (kill) any RAM file with function key ease.

This description only scratches the surface of this amazingly powerful piece of software. Dot commands allow control of such things as margins, centering, line spacing and other changes in the middle of a document. Most are WordStar[™] compatible.

A mailmerge feature allows you to send the same document to every name on your mailing list, personalized for each recipient.

WRITE ROM enables you to do underlining, boldface and correspondence mode as well as any other font feature like superscripts that your printer supports, in a way that many users say "is worth the price of the program."

To underline you don't have to remember a complicated printer code. You just type CODE u, and to stop underline, CODE u again. The CODE key is to the right of your spacebar. Boldface? CODE b to start and stop. Easy to remember and do. Five different printer features of your choice.

We couldn't list all the features here. For example, you can select not just double space but triple or any other. You can use your TAB

key in a document. WRITE ROM allows you to indent. This means you can have paragraphs with a first line projecting to the left of the rest of the paragraph. WRITE ROM has a feature unique for any word processor on any computer. It's called FORM. FORM is an interactive mechanism that lets you create screen prompts so that you or someone else can answer them to fill out forms or questionnaires.

With FORM, any place that you had previously typed a GRAPH T and a prompt in a document, WRITE ROM will stop and show you that prompt on the screen. You can type in directly on the screen and when you press F8 you see the next prompt. It goes to a printer or a RAM file.

Think how you can use FORM. A doctor or nurse could use it for a patient's history with each question appearing on the screen. An insurance salesman could use it for his entire questionnaire. You could construct a series of prompts to answer correspondence, typing the answers, even using Library codes. This feature lets you answer letters in rapid-fire fashion, each with personalized or standard responses.

Before WRITE ROM you had to be a programmer to create a series of prompts. Now it's as simple as GRAPH T.

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3 Total items printed

Figure 4. The resulting "Reports" are actually mailing labels, with the last label showing the total items printed.

tab to the space which has appeared (matching your original field size) and type in the information exactly as you are searching for it. You can set limits or ranges for several fields at once—another plus. Once it has the information it needs from the user (and you'll gather speed with time, I promise), it responds quickly with the item or items that fit the bill. You can see an on-screen report, and print it.

Another nice thing about *Filer/Form Setup* is that you can toggle between the two programs via the F2 (File function key) menu. One of the choices on the Filer F2 screen is *Form Setup*; the corresponding spot on the *Form Setup* F2 menu is occupied by *Filer*. So, if you enter an item and realize that you need to modify your template, you just switch back and do it (as long as you're not making drastic changes to a form on which you've already input data). Actually, the *Filer* function buttons are more or less "classic DeskMate." F1 is Help; F2 is File (Open, Copy layouts, Page setup, Form setup, Print record, Print report, Exit, Run, About); F3 is Edit (Cut, Copy, Paste, Clear); F4 is Records, unique to these two programs (Add, Delete, Copy/First, Next, Previous, Last/Find, Sort, Count). The Copy Layouts command allows the user to start a new file using an already-established template. Most of the F4 functions are also available using a control-and-key combination. The screen always shows the user the First/Next/Previous/Last buttons, just so you know where you are—at the end of the list, the beginning, or the middle.

The *Form Setup* buttons are a little less classic—or, at least, there's more of them. F1 and F2 are more or less the same as *Filer*, but F3 (Edit) offers the choices of Cut, Copy,

Paste, Clear, Move Picture, and Size picture. F4 (Record) consists of Define and Sort. F5 (Report) determines how pretty your output will be: Define, Show Page, Today's date, Page number, Summary, Resize section, Clear all. Show Page displays a "working dummy." Resize Section lets the user adjust the sizes of the header, footer, body, and summary (as I had to do to make mailing labels). Clear All can be fatal if you haven't been saving your work as you go along! F6 (Field) lets the user doctor up the screen information: Add, Change, Size, Format. F7 (Text) has only three

choices: Plain, Bold, Underline. If you are going to print your information with the field labels printed as well, you may wish to boldface or underline them to distinguish them from the information you typed in the blanks.

A word of warning when you are first defining your fields in *Form Setup*: Understand what you are defining. Many people forget that if they assign a code 017 to something, it is no longer numeric—it is fixed. They will never be totaling this up with other codes for a pounds/shillings/pence result; they will be picking 017's out of a batch of mixed 017's and non-017's. Likewise, beginning spaces, quotation marks, periods, asterisks, etc. will be sorted ahead of the letter A, so watch how you use them.

Figure 1 is my first successful *Form Setup*. The shaded blanks mark every tenth

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space, for ease of counting. Figure 2 is from the *Filer* program, showing actual information in the blanks. This figure is the result of a "Print Record" command and not the actual appearance of the screen. Because of the graphics used by *Form Setup*, the computer will not willingly Print Screen. Figure 3 is the result of a "Print Report Format" command, showing how I set up the Report screen to give me mailing labels. (The labels for the various sections, although visible on screen, did not print—so I hand-write them on the figure.) The report labels fall below the sections they describe. I needed no Header. My Report Body had a message that appeared on each label ("Requested from Portable 100"), but I requested that the field descriptors not be printed. You can guess where Name, Address, etc. will fall on each label, but you don't see the printed words. The Summary, appearing at the end, consists of one line: a count, followed by the words "Total items printed." There is no footer, and the rest of the screen is filled with dots

Automotive Maintenance and Repair Records

MM DD, YYYY

Page : ***

[Shaded header bar]											
[Grid of 12 columns and 10 rows for data entry]											
[Shaded footer bar]											

Average Cost: [Grid] Total Cost: [Grid]

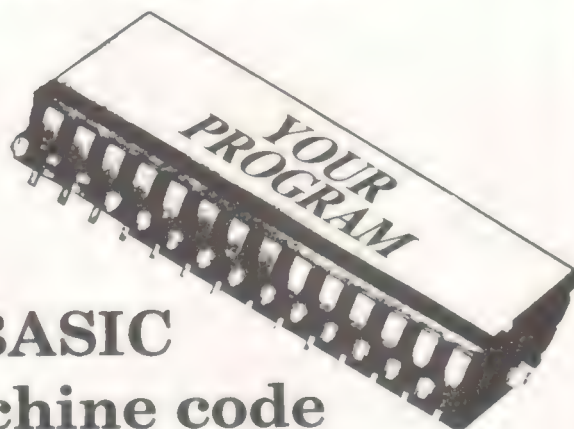
Figure 5. Nice *Form Setup* work by the Tandy programmers.

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DESKMATE

just to show that the report has been shortened.

Figure 4 shows *Filer* in use, printing labels. I limited my search to companies with ZIP codes greater than 90001, RSI codes greater than or equal to 160, and issue dates equal to 12/91. (I could have also chosen "From... to..." and "Not equal to" as well as "Equal," the most limiting choice of all.) As you can see, the result was three labels total.

Since my adventures with mailing labels, I have met other people who use *Filer* for other purposes. No two people use it the same way, which speaks volumes for its adaptability. One user tracks maintenance and repair of his family's four cars. Another keeps a home inventory. Yet another logs in his hospital bills, Medicare and Medicaid on it. Another keeps a travelogue. A budding author keeps track of his rejection collection. All are novices, for whom *Filer/Form Setup* has been a first venture in databases.

In my opinion, *Filer* balances clumsiness in some aspects against speed and versatility in others. The Teach Me tutorial included with *DeskMate* could be better, but Michael Banks's description in the *DeskMate* book discusses issues left unmentioned by the tutorial. More than anything, capable use of the *Form Setup/Filer* combo requires practice. Some day—if I keep at it—I hope to be able to produce forms as sharp as Figure 5, done in *Form Setup* by the folks at Tandy and included as part of the tutorial. Pretty sharp, eh? And you must see the data input screen as well. Someone spent a long time lovingly drawing that red sports car.



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FILER and *FORM SETUP* are part of the *DeskMate 3 Productivity Software* package.

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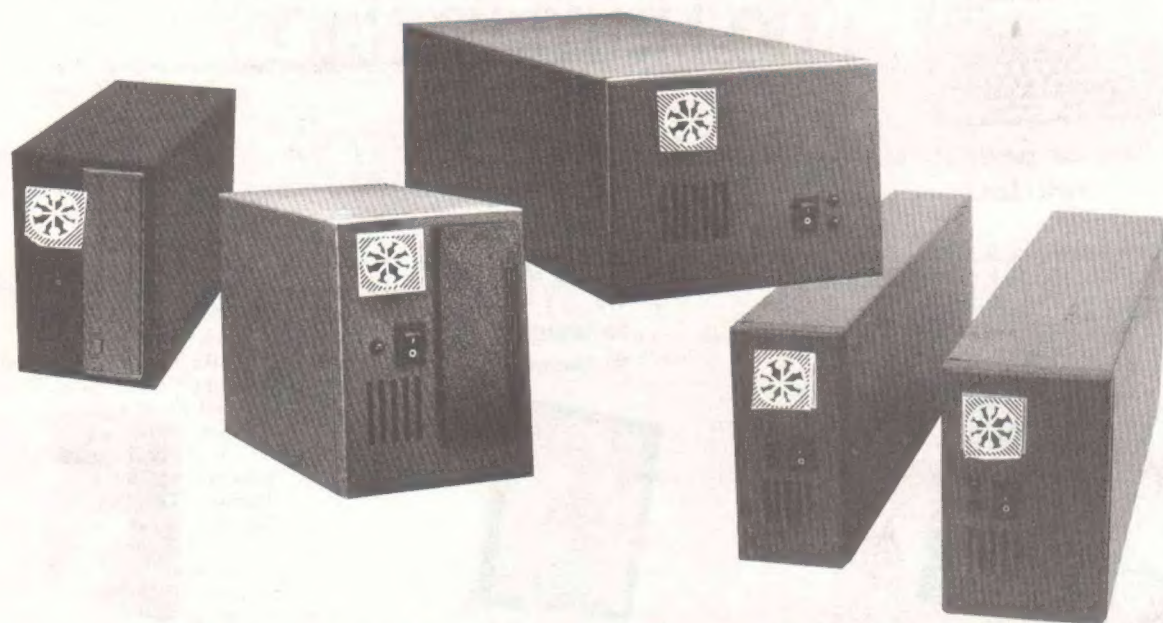
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